

REPORT BY THE
AUDITOR GENERAL
OF CALIFORNIA

AN AUDIT OF THE
CALIFORNIA DEPARTMENT OF CORRECTIONS'
CONSTRUCTION OF THE SAN DIEGO PRISON



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Acting Auditor General

April 12, 1989

P-847.2

Honorable Elihu M. Harris, Chairman
Members, Joint Legislative
Audit Committee
State Capitol, Room 2148
Sacramento, California 95814

Dear Mr. Chairman and Members:

The Office of the Auditor General presents a report prepared under contract by Arthur Young concerning the California Department of Corrections' construction of the San Diego prison.

This audit was conducted to comply with Item 5240-001-747 of both the 1988 Budget Act and the "Supplemental Report of the 1988 Budget Act."

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Kurt R. Sjoberg".

KURT R. SJOBERG
Acting Auditor General

Office of the Auditor General

**An Audit of the
California Department of
Corrections' Construction of
the San Diego Prison**

FINAL REPORT

April 1989



Arthur Young

**REPORT TO THE
OFFICE OF THE AUDITOR GENERAL**

P-847.2

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OF CORRECTIONS' CONSTRUCTION OF THE
SAN DIEGO PRISON**

APRIL 1989

ARTHUR YOUNG

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YOUTH AND ADULT CORRECTIONAL AGENCY
Office of the Secretary

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SUMMARY

RESULTS IN BRIEF

Total final capital outlay costs for the San Diego prison are estimated by the CDC to be \$158 million. As of March 7, 1989, \$157 million has been encumbered. In our financial audit of these costs we found that the costs, as compiled by the CDC, are properly stated, complete, and adequately supported.

The prison's final budgeted cost of \$158 million is reasonable compared to other medium security prisons. The final computed cost per bed is \$61,368. This cost is among the lowest of all California Level III prisons examined. In comparison to other states, the total cost per inmate also was determined to be reasonable.

We reviewed responsibilities for management of the various capital outlay cost items and found that neither the Department, the Program Manager, the Architect, nor the Construction Manager could have prevented major cost overruns or delays and still be in compliance with both legislative cost targets and CDC correction design standards.

In our review, we found that some change orders reflect increase in work due to design changes and owner requests which were not included in bid packages. Because these items were not competitively bid, we estimate that approximately \$250,000 may have been paid in additional mark-ups to contractors. This additional cost, however, was a tradeoff for maintaining the planned schedule for housing inmates at the new prison.

Of the fifteen construction contracts awarded for the San Diego prison, there were only two construction claims. The two claims totaled approximately \$1.8 million. This amount is significantly lower than the average \$26 million in claims filed at two prisons built before San Diego.

While construction of the San Diego prison appears to be complete, the CDC is still experiencing some problems in operation of the prison. Some buildings of the new prison are still not being used. These buildings include four gymnasiums and the building constructed for the Prison Industry Authority's textile mill.

PRINCIPAL FINDINGS

Capital Outlay Costs of the San Diego Prison, as Compiled by the CDC, Are Properly Stated, Complete, and Adequately Supported by Source Documentation

Capital outlay costs of the San Diego prison include primarily construction costs and their related change orders, contracts retained and awarded by the CDC, architectural and engineering fees, equipment, and costs of project and construction management.

Capital outlay costs, as compiled by the CDC, are accurate, complete, and adequately supported by source documentation. Approximately \$1.27 million of capital outlay costs of the prison were allocations of invoices from the construction and program managers. We could not verify that this allocation reflected actual work performed on the San Diego prison.

There is an outstanding claim of \$1.8 million from a contractor for the cogeneration plant built at the San Diego prison. The CDC is disputing the amount, and at this time any potential payment cannot be quantified. If the CDC is required to pay on this claim, the claim settlement should be added to the cost of the San Diego prison.

Capital Costs for San Diego Were Not Excessive When Compared to Other Medium Security Prisons

When compared to seven other medium security prisons, San Diego prison costs were not excessive. The adjusted cost per bed, based on the methodology established by Senate Bill 422, is \$61,368. Though this amount exceeds the initial authorization of \$50,000, the prison has the second lowest cost per bed of seven new California prisons, and is 5.1 percent lower than the average for these seven prisons.

In comparison to prisons in other states, we encountered some problems in comparing costs to other states. The obstacles include design capacity, vocational programs, and efficiency in operation. In order to make the comparison, we relied solely on the total cost per actual inmate population. San Diego's cost per inmate is in the range of other state's cost per inmate. While San Diego may have higher construction costs, its design may lead to significantly lower life-cycle costs. San Diego's inmate to staff ratio is

3.7 and is the highest of all the states reviewed. The ratio is 35 percent higher than the average and is likely to lead to lower operating costs.

The CDC, Program Manager, Construction Manager, and Architect Could Not Have Prevented Major Cost Overruns and Delays and Still Comply With Both the Legislative Cost Targets and CDC Correctional Design Standards

The responsibilities of management for various capital outlay cost items were reviewed to determine if the Department, the Program Manager, the Architect, or the Construction Manager could have prevented major cost overruns or delays experienced at San Diego. We determined that none of the parties we reviewed could have prevented the major cost overruns or delays and still be in compliance with both legislative cost targets and the CDC correctional design standards the Department was developing at the time the San Diego prison was being designed.

The Total Cost of the San Diego Prison Was Increased Due to Changes to Lump Sum Contracts Above the Contingency Allowed for Change Orders

Documentation for a sample of change orders was reviewed in order to determine the cause for the change. We also reviewed and analyzed the underlying causes and related documentation to determine at what point, if any, such causes could have been identified and prevented, and who should have had responsibility for taking the appropriate action.

In our review of sample change orders, we found no change orders to be avoidable or preventable. There were, however, some increased costs due to design changes and owner requests that were not included in the initial bid documents. Because the increase in work occurred after contracts were awarded, the CDC may have lost some benefit from the competitive bidding process. We estimated that the increased cost due to the lack of competition is in the order of \$250,000.

The CDC Has Experienced Problems in the Operation of the San Diego Prison

While construction of the San Diego prison appears to be complete, the CDC is still experiencing some problems in operation of the prison. During our on-site tour of the facility we identified four problem areas still existing at the prison. The gymnasiums completed in 1987 still remain unoccupied. The textile mill building constructed for the Prison Industry Authority remains empty and unused. The PIA recently began construction of tenant improvements and anticipates completion of the textile mill by June 30, 1990. The prison's dining and kitchen areas were designed with gypsum interior walls which are easily damaged by inmates. Also, from our on-site tour we noted that the cogeneration plant was not secured. The plant provides all electrical services for the prison and inmates in the area could damage the source of power for the whole facility.

RECOMMENDATIONS

The following recommendations are made regarding the CDC and its function as administrator of the San Diego prison project:

- The contract with Heery/Vanir (construction manager for the San Diego prison) is not clear as to how indirect labor charges are to be allocated among the different prisons. Heery/Vanir presently bills charges based on the proportion of direct labor charges for the various projects. In the future, contracts with construction management contractors should specify the methodology for charging each prison for labor hours of personnel who work on various prisons.
- In determining what the actual budget was for the San Diego prison, we encountered difficulties in obtaining an original budget. In order to monitor and assess the status of projects, we recommend that the CDC designate one original budget and not modify this budget during the prison project.
- The CDC and Kitchell are currently monitoring the cost per bed of prisons in the new prison construction program. It is recommended that the CDC, assisted by its Program Manager, continue to closely monitor, manage and compare the cost per bed of all facilities throughout the program by security level classification.

- The CDC should continue the current practice of preparing detailed cost models and schedules which were not yet formalized for the San Diego Prison. Separate contingencies recognizing the preliminary nature of early estimates should be incorporated in the development of budgets prior to approval.
- Cost Control and Schedule Reports should be issued by the Program Manager on a monthly basis throughout the design and construction phases, as recommended in the Office of the Auditor General's February 1989 report, *An Audit of the California Department of Corrections' Program Management Contractor*.
- The CDC should review all future projects and establish a common work breakdown structure so that original budgets, actual costs, and forecast costs at completion prepared by the Program Manager, the CDC and the Construction Manager are prepared in an integrated manner, consistent with one another. The CDC should assign the responsibility for implementing this recommendation to its Program Manager.
- The CDC and its Program Manager should continue their efforts of improving the overall quality of original bid documents to minimize errors and omissions by the designers. Firmly established criteria and realistic design and construction schedules, including sufficient time for the design team to incorporate comments from design reviews, will assist in achieving this objective.
- The reasons for change orders should be determined initially by the Program Manager for approval by the CDC. The Construction Manager is not necessarily in the best position to judge the responsibility for the change because of not being involved in all phases of the project. Many changes are a result of interfaces between contracts, cost/schedule tradeoffs, or other bid packaging strategies which the CDC or Program Manager feel appropriate to meet the goals of the project. The CM is placed into an adversary role with other team members when acting as a judge of the designer and Program Manager.
- Costs for temporary facilities associated with early occupancy criteria should be incorporated into budgeting and cost forecasting. Whenever possible, the temporary facilities should be incorporated into the original bid documents and be considered separately when evaluating change order experience.
- During our review of change order files, we noted that there were several differences in the cost estimates for change orders made by the Construction Manager and by

the contractor. The CDC should audit construction manager and contractor estimates to ensure that change order estimates are properly calculated.

- At San Diego, there were two time and material change orders. For both change orders, the required daily records for labor, materials, and equipment were not properly maintained. There was a lack of coordination between the Construction Manager and the Office of the State Architect in regards to the certification of the required documentation. We understand that on current projects, the Office of the State Architect is now responsible for certifying required time and material documentation. The CDC should continue this practice to ensure labor and materials provided relate to a time and materials change order. Also, the CDC should require that the contractor submit progress billings on the change order at least monthly.
- The design and construction of newer prison facilities has incorporated improvements to prior designs and carried forward designs that the CDC and the Project Manager considered well designed. The CDC should continue this evolutionary process.
- The CDC used some less than secure materials in the construction of the dining and kitchen areas of the San Diego prison. In the construction of subsequent prisons, the CDC has modified the designs of dining and kitchen areas to minimize the use of gypsum board. The CDC has not updated its Design Criteria manual to reflect the change in materials. The CDC should update the Design Criteria Manual to prohibit the use of gypsum board in interior walls of the kitchen and dining areas in medium and higher security facilities.
- The CDC should secure the cogeneration plant with appropriate security measures to prevent inmates from entering the plant and damaging the equipment. The cogeneration plant at the San Diego prison is not adequately secured to prevent inmates from entering the facility and damaging the source of electrical supply to the whole prison.

AGENCY COMMENTS

The California Department of Corrections is very pleased with this audit. The CDC states that it agrees with many of the recommendations and will implement some of them.

The CDC is concerned that the benefits derived from the Program Manager issuing Cost Control and Schedule Reports on a monthly basis throughout the design and construction phases may not justify the additional costs. However, they plan to further study this recommendation.

Furthermore, the CDC states that the Construction Manager should continue to perform the initial evaluation of the responsibility for change orders. However, they will instruct the Program Manager to take a more active role in this phase of the change order process to ensure that the initial analysis is accurate.

INTRODUCTION

BACKGROUND

The State of California has been engaged in a massive prison construction and renovation program for over seven years. The genesis of this program was a "master plan" prepared for the CDC in 1979 by the Atlanta-based firm of Rosser, White, Hobbs, Davidson, McClellan, Kelly, Inc. Revisions in this master plan were ordered by the Legislature in 1980, and some initial construction work started that year. But it was not until after voters approved the first of several prison construction bond acts in 1981 that funds were available for large scale, multiple facility development projects.

For many state building projects, the Department of General Services is responsible for the planning, design, and construction oversight functions. However, because of the specialized nature of corrections facility construction, the legislature gave the CDC statutory authority for these functions whenever prisons are involved.

In 1981, the CDC decided that the size of its projected construction program would necessitate the employment of a program manager to help manage the pre-design and design phase of the new prison facilities and to perform selected tasks in support of the program. All of the new prison facilities except for the Southern Maximum Security Complex have been constructed with the same program manager. Construction managers and architects, however, have varied among prison sites.

The CDC had planned to build a state prison in San Diego County since the mid-1960s. However, due to a previously decreasing prison population, design of the prison was not initiated until 1982.

In 1967, the CDC purchased a site for the San Diego prison, however, the Legislature expressed its preference for a different prison site in the 1981 Budget Act. In 1983 the CDC obtained another site on which the current prison is located. The official name of the prison is the "Richard J. Donovan Correctional Facility at Rock Mountain".

The prison was originally intended for 1,100 maximum security inmates. However, changes in the prison facilities master plan and the increasing demand for inmate housing caused the design to be revised to a facility housing 2,000 medium security

inmates (Level III) and 200 minimum security inmates (Level I). Legislative approval of the facility also limited the construction cost of the facility to less than \$50,000 per bed. Construction cost per bed has been revised several times and currently it is approximately \$61,000 per bed.

In 1985 the Office of the Auditor General performed an audit of the planning and design of the San Diego prison. The result of the audit indicated that the CDC had problems in the planning and design of the prison.

In 1988 the Legislature again selected the San Diego prison for a special review of costs. While the new prison construction program has experienced overall satisfactory performance, a review of the San Diego prison reveals problems experienced by the CDC. For example, the San Diego prison will be completed at \$12 million over the revised approved budget and five months behind schedule.

SCOPE AND METHODOLOGY OF FINANCIAL AUDIT

The purpose of our financial audit was to determine if:

- The capital outlay costs of the State Prison at San Diego, as compiled by the CDC, are properly stated, adequately supported by source documents, and represent valid costs of the prison
- Significant capital costs of the San Diego prison were recorded against proper appropriations, and thus charged to the San Diego prison.

Our scope included a review of billings and contract awards, as maintained by the CDC, through December 31, 1988 and did not include a review of any Prison Industry Authority or CDC administration costs.

Our approach relating to the first item above was to examine contract awards, related billings and accounting data to determine if the capital outlay costs of the San Diego prison are recorded at the proper amount of the contract. As we reviewed the contracts and billings, we noted whether they were in conjunction with the design and construction of the San Diego prison in order to test the validity of the costs. We also correlated our review of significant contracts and billings with an on-site tour of the San Diego prison that we made in January 1989. The second item above relates to the assertion of completeness of capital outlay costs of the San Diego prison. Our approach to testing this assertion included:

- A review and evaluation of internal accounting controls utilized by the CDC accounting and planning and construction personnel
- A review of the billing and allocation methods utilized by the construction manager, Heery/Vanir, and the project manager, Kitchell CEM, in billing the CDC
- A review of unusual relationships of budget vs. actual costs of the San Diego prison
- A review of unusual relationships of costs of the San Diego prison as compared to other similar sized state prisons.

It should be noted that the CDC performs no allocation procedures relating to billings from contractors and, therefore, no review was necessary to evaluate allocation methods of the CDC.

Our procedures to test labor billings of Heery/Vanir included a detailed analysis of a statistical sample of labor charges and reimbursable expenses to determine if the billings were correct and in accordance with the contract. We tested these charges to determine whether Heery/Vanir charged the appropriate prison project and to determine whether Heery/Vanir's billings were in accordance with the contractual specifications. These procedures were performed on billings from Heery/Vanir subsequent to June 1985, as billings prior to this time were not prison-specific amounts or were insignificant as compared to subsequent charges (i.e., charges prior to July, 1985 represent less than 1 percent of the entire Heery/Vanir charges to San Diego). Certain of the charges prior to 1985 were not allocated initially by the contractor among the various prisons and required an allocation. The CDC and the contractor discussed the charges and allocated them based on estimates made by the CDC and the contractor. We examined the billings from Heery/Vanir prior to July 1985 and the allocations to the San Diego project for overall reasonableness and to determine that the total contract charges were in accordance with the contract and properly recorded by the CDC.

We tested the charges of the program manager (Kitchell CEM) based upon our procedures performed and results documented in the "REPORT BY THE OFFICE OF THE AUDITOR GENERAL, P-847.1, *An Audit of the California Department of Corrections' Program Management Contractor*, dated February 1989, with a detailed analysis of billings to San Diego. Our procedures in that audit included testing the propriety of the overall billings to the CDC in accordance with the contract but did not

include procedures to test the propriety of charges to specific prisons. We, therefore, randomly selected two months out of each year and verified that the charge to San Diego was proper based on time sheets and reimbursable charges of Kitchell CEM employees. We also reviewed the other monthly billings for reasonableness as compared to the months we actually tested.

Capital costs other than for the program and construction management contractors are evidenced by contracts or invoices, which we generally examined in their entirety. There were certain costing categories (i.e., equipment and miscellaneous consultants) which were comprised of a large number of contracts or invoices which we tested by selecting informal samples in order to draw our conclusions.

SCOPE AND METHODOLOGY OF PERFORMANCE AUDIT

The objectives of the performance audit of the San Diego prison were as follows:

- To determine if any costs, cost overruns or delays were avoidable and, if so, to assess whether the CDC, program manager, construction manager, or architect could have prevented such costs, overruns, or delays
- To determine if capital costs were excessive
- To provide recommendations for future similar projects, as appropriate.

The performance audit began with a review of the CDC's change order process as it operated during the construction of the San Diego prison and the various stages of the change order process as it has evolved to its present form. We assessed the methods used to calculate the costs of change orders and the manner in which claims were reviewed and evaluated.^{1/} Based on these analyses we were able to provide a general assessment of the change order/claims review process and recommendations for improvement.

For the review of change orders and claims, we selected a sample and reviewed the supporting documentation of the selected sample related to causal events and calculations of costs. We classified each change order and claim according to type (e.g., delay, disruption, change in scope, acceleration, etc.) and the stated causes identified (e.g., defective drawings, changes in specifications, changed conditions, restricted access, etc.).

^{1/}The scope of this effort should not be construed as a detailed assessment of each claim for purposes of supporting or defending against potential litigation.

We also reviewed and analyzed the underlying causes and related documentation to determine at what points, if any, such causes reasonably could have been identified and prevented, and who should have had responsibility for taking appropriate avoidance action.

We performed a comparison of approved change orders at the San Diego prison to other prison facilities in the CDC's new prison construction program and with new prisons constructed in other states to further assess the reasonableness of these approved change orders and to determine if capital costs were excessive.

During a review of change orders and claims, it was determined that significant increases in costs were not directly attributable to change orders or claims. Because of this, we also conducted interviews of the Project Manager, Construction Manager, Architect/Engineer, and CDC personnel to determine if other costs were also preventable.

I.

CAPITAL OUTLAY COSTS OF THE SAN DIEGO PRISON, AS COMPILED BY THE CDC, ARE PROPERLY STATED, COMPLETE, AND ADEQUATELY SUPPORTED BY SOURCE DOCUMENTATION

The CDC is responsible for compiling capital outlay costs of the State Prison at San Diego. Capital outlay costs include the cost of the materials used in construction, certain installed equipment, and costs charged by entities outside of the CDC relating to the planning and administration of the construction of the prison. The costs of the San Diego prison should include all costs of this prison, and should not include any costs related to other prisons.

Based on our examination of the costs as compiled by the CDC, we have concluded that on an overall basis, these costs are accurate, complete, and adequately supported by source documentation.

**A. Capital Outlay Costs Do Not Include
Costs of Other Prisons**

The cost of the San Diego prison should not include any costs related to other prisons in the State of California. **Exhibit I-1**, following this page, is a schedule of Public Works Board approved amounts, encumbered amounts, and expenditures for Capital Outlay Costs of the San Diego prison through December 31, 1988, as compiled by the CDC. The following is a definition of the costs, the extent of testing we performed to verify the propriety of the amounts shown, and our conclusions and recommendations.

Construction Contracts/Contingency

Construction contracts and contingencies represent contracts awarded to various contractors under fifteen "bid packages" of the San Diego prison plus various change orders and claims. Change orders represent approved changes in the construction under any of the original "bid packages." Claims generally represent disputed costs incurred by contractors which they believe were due to circumstances beyond their control. We examined all contracts, claims, and significant change orders of costs relating to construction contracts and contingencies.

Schedule Of Appropriations And Capital Outlay Costs Of The State Prison At San Diego (as compiled by the CDC) Through December 31, 1988

TYPE OF COST	PUBLIC WORKS BOARD APPROVED AMOUNT	ENCUMBRANCES	EXPENDITURES	COSTS TO COMPLETE (EST.)
Construction contracts/contingency	\$ 112,175,804	\$ 112,172,319	\$ 111,819,579	\$ - (a)
CDC Agency Retained	14,356,477	14,039,841	9,454,969	4,650,000(b)
Architectural and engineering	6,989,537	6,841,099	6,819,717	-
Movable equipment	6,633,799	6,087,466	4,778,070	430,000(c)
Long lead contracts (toilets, electronic cell doors and console units)	6,071,185	6,020,370	6,015,428	-
Construction management	3,903,750	3,903,750	3,732,786	20,000
Previously expended contracts	2,859,000	2,859,000	2,859,000	-
Project management	2,435,557	2,435,557	2,262,179	-
Office of State Architect inspection fees	2,003,771	1,998,333	1,824,630	500,000(d)
Miscellaneous consultants (ground tests, misc. blueprints, etc.)	869,000	671,071	552,128	-
Land acquisition	343,500	271,613	271,613	-
PIA reimbursement	<u>(290,516)</u>	<u>(290,516)</u>	<u>-</u>	<u>-</u>
Totals	\$ <u>158,350,864</u>	\$ <u>157,009,903</u>	\$ <u>150,390,099</u>	\$ <u>5,600,000</u>

- (a) An outstanding claim of \$1.8 million against the CDC exists on the cogeneration plant at the San Diego prison. The CDC is analyzing the claim and the case has not been scheduled for arbitration; therefore, no range of loss can be estimated, if any.
- (b) Costs for the Otay Mesa road and small, miscellaneous projects.
- (c) Costs for a trunked radio system.
- (d) Costs anticipated from the final invoice from the Office of State Architect (OSA).

CDC Agency Retained

These are certain constructions costs which were unique to the San Diego prison. The most significant of the approximately \$14 million CDC Agency Retained costs include:

- Construction of the Otay Mesa Road adjoining the prison which cost approximately \$6.1 million
- Installation of required water and sewer line which cost approximately \$4.9 million
- Installation of an electronic and communication system costing \$1.4 million.

We examined contracts accounting for over 90 percent of these costs.

Architectural and Engineering

This category includes costs for preliminary design drawings, working drawings during construction, and other engineering and architectural costs. The majority of this work was awarded to Hope Consulting. We reviewed all contracts and contract amendments with Hope.

Movable Equipment

Movable equipment represents equipment purchased for the prison which is based on a standard listing of necessary equipment required at a correctional facility. The CDC has spent approximately \$4.8 million of the approved \$6.6 million. We selected every purchased equipment item from the standard listing with a cost in excess of \$7,000 and traced the purchase to a related invoice, purchase order, and receiving document. We tested approximately 35 percent of the total cost incurred.

Long Lead Contracts

Long lead contracts are for the purchase of cell doors, console units, and bathroom combo units. The term "long-lead" refers to the amount of advance time necessary to obtain these items in conjunction with the construction contracts. We examined all purchase orders and billing invoices.

Construction Management

This amount represents labor charges and direct reimbursable expenses of the construction management firm of Heery/Vanir since April 1982. Our testing of the labor billings included overall review procedures, detailed tests of individual labor charges, and an evaluation of the reasonableness of indirect labor charges. First, we summarized the monthly labor bills for each contract year and compared them to the capital outlay costs allowable within the contract. We also reviewed the labor bills for reasonableness and checked the math accuracy of a sample of the bills.

We reviewed the labor bills prior to July 1, 1985 and discussed the method of billing with the CDC and personnel at Heery/Vanir. The contract with Heery/Vanir was not explicit concerning the method of allocating its labor charges to specific prisons. Therefore, billings prior to April 1985 were a lump sum total of all costs and required a subsequent allocation by Heery/Vanir to charge the various prison projects.

Our detailed testing of the labor bills for the period July 1, 1985 to June 30, 1988 was performed by selecting a statistical sample of 94 "direct individual labor charges," defined as one individual's labor bill for one month. This labor bill is calculated by multiplying hours billed to the CDC by the billing rate as established in the contract for that person. This resulting amount represents the direct labor portion of the monthly bill.

In order to determine that the "individual labor charge" was appropriate, all three components of the charge (hours billed, labor rate, and math accuracy) were tested:

- The first component was hours billed, which we traced the total hours billed for the month to individual time sheets
- The second component was the labor rate. Heery/Vanir's contract sets the labor rates based on the classification of the employee. In order to verify that the rate was appropriate, we traced the rate on the bill to the contract amendment appropriate for the month being tested
- The third component was math accuracy, which was tested by multiplying hours billed by the labor rate.

To determine if reimbursable expenses billed were appropriate, we compared the amounts billed to the contract and determined if Heery/Vanir billed the CDC in accordance with the contract. We also reviewed the charges for reasonableness and noted no unusual items.

Heery/Vanir charges for the period July 1, 1988 to December 31, 1988 are less than \$20,000. They were reviewed for reasonableness.

Previously Expended Contracts

Previously expended contracts represents the following:

- An original contract negotiated with Hope Consulting for approximately \$1,900,000 not included in the caption "Architectural and Engineering" in **Exhibit I-1**,
- Office of the State Architect (OSA) inspection fees of \$786,000,
- Miscellaneous other costs of \$173,000.

The term "previously expended" is used as these costs were incurred prior to or near the time of the appointment of the CDC as administrator of the design and construction of state prison facilities. Prior to CDC's

appointment, the Office of the State Architect was managing the prison construction in California. When responsibility for design and construction was transferred to CDC's Planning and Construction division, so also were these costs. We examined the contract for Hope Consulting and a sample of inspection fees from OSA prior to 1982.

Project Management

Project management costs relate to labor charges from Kitchell CEM, the program manager for all prisons since 1982. Our testing included correlating results from our work performed in our audit, "Report by the Office of the Auditor General, P-847.1, An Audit of the California Department of Corrections Program Management Contractor", dated February, 1989, and verifying that charges from Kitchell CEM were for San Diego labor.

Office of State Architect Inspection Fees

These are fees charged by the OSA for its inspections of the overall construction at the prison. We analyzed the contract and the billings to determine if the costs attributable to the OSA are materially correct and are attributable to the San Diego prison.

Miscellaneous Consultants

These are costs for testing of the prison site prior to construction, miscellaneous blueprint costs, and contracts with utility agencies. We reviewed contracts covering approximately 60 percent of these costs.

Land Acquisition

This is the acquisition of land easements and settlement of disputes between the CDC and a regulatory agency in San Diego County. The Department already owned the land but had to settle an easement dispute. We reviewed a sample of the related invoices.

PIA reimbursement

The reimbursement from the Prison Industry Authority (PIA) is for funds spent by the CDC for supplemental construction of the PIA buildings and projects located at the prison which are to be reimbursed to the CDC by the PIA. We reviewed the contract correspondence which included PIA's confirmation of the propriety of the amount.

Based on our analysis of the capital outlay costs of the San Diego prison, as compiled by the CDC, and our detailed testing of the various categories of capital costs, we found that the capital costs as shown in Exhibit I-1 are properly stated and adequately supported by source documents. However, there were some costs which were from billings allocated among the prisons by the contractor for which we were unable to verify the allocation. Also, we found two other minor items. One related to a billing error, and

the other to old costs which could not be verified. The detail of these items is presented below.

- San Diego was allocated approximately \$300,000 of the total payments of approximately \$850,000 related to certain charges from Kitchell CEM from 1982 through June 1983, which were billed as a total amount and were not allocated among prison projects. Based on information available to us, we were unable to determine if such allocation was proper.
- Heery/Vanir, the construction manager, billed the CDC approximately \$17 million for work performed on four prisons under its contract with the CDC. Of this amount, approximately \$14 million represents charges of individuals who work on specific prison projects and approximately \$3 million represents charges of supervisory personnel who oversee the work being done on all prison projects.

The amount charged for this supervisory time is not supported by time sheets or other supporting documentation and the allocation among the prisons could not be tested. Of this \$3 million, San Diego was charged approximately \$800,000. Although nothing came to our attention which caused us to believe this amount is inappropriate, we are unable to determine if it was allocated properly.

- \$173,000 of costs included in previously expended contracts were not verified as contracts or invoices for this amount were not located.
- Approximately \$2,300 of billings from the construction manager in November 1986 and January and September 1987 were in error, based on our testing of the time sheets of Heery/Vanir. When this sample error is projected to the population, the total amount overcharged to the CDC is approximately \$10,000.

The above noted items, in total, amount to approximately \$1,280,000, or less than one percent of the total cost of the prison. Because approximately \$1,270,000 of this amount relates to costs which we were unable to verify, but for which nothing came to our attention to believe that these amounts were improper, these items do not affect our final conclusion that the capital outlay costs of the San Diego prison are materially correct and are adequately supported by source documentation.

**B. Capital Outlay Costs As Presented
Are Complete**

In order for the capital outlay costs as presented to be complete, they must include all capital outlay costs of the San Diego prison. In order to determine if the capital outlay

costs for the San Diego prison as presented are complete, we performed the following procedures.

- We discussed internal control procedures within the CDC to determine how the CDC ensures that costs are charged to the appropriate prison. If costs are charged to the appropriate prison, then capital outlay costs for San Diego are assumed charged only to that prison.
- We compared the major cost categories of San Diego against several other similar prisons. The purpose of this test was to search for cost categories at San Diego which appeared low when compared to these other prisons, as this might indicate that the San Diego costs as presented were not complete.
- We compared San Diego's actual cost to the budgeted cost. Any items which were significantly under budget were analyzed to determine if they were truly under budget or if the actual cost as presented was incomplete.
- Our auditors made a visit to the San Diego prison, and correlated their observations of the prison to the major cost categories as presented.
- When performing our testing on invoices as described in Section A, above, we performed additional testing on those invoices which pertained to more than just the San Diego prison. The purpose of this testing was to determine if additional amounts from these invoices should have been allocated to the San Diego prison.

We found that the internal control procedures, as described to us by the CDC, should help to ensure that capital outlay costs are charged to the correct prison. For our purposes, this means that capital outlay costs of the San Diego prison should only be charged to that prison, and are not included in the costs of any other prison. As with any internal control procedures, their effectiveness correlates to compliance with the procedures, and they cannot be guaranteed to prevent or detect all errors.

As another test to search for costs of the San Diego prison that may not be shown in the amounts compiled by the CDC, we compared capital outlay costs of the San Diego prison to other similar sized prisons which are in use and have been projects of the CDC during the same time frame as the San Diego prison. We expected similar cost relationships among similar sized projects and, if unusual relationships were noted between the San Diego prison and other similar prisons, we conducted investigations to determine

that there were valid reasons for the cost differences. If we could not find valid reasons why other similar prisons cost more than the San Diego prison, then this could indicate that some costs of the San Diego prison are not being shown by the CDC.

The prisons selected were:

- Amador, a 1,500-bed Level III facility with an additional 200 Level I beds,
- Avenal, a 3,034-bed Level II facility,
- Riverside, a 2,000-bed Level II facility.

The costs used in the testing are highlighted in Table 1 following.

Table 1
Schedule of Appropriations of San Diego, Amador, Avenal, and
Riverside Prisons, as Compiled by the CDC
Through December 31, 1988

TYPE OF COST	SAN DIEGO	AMADOR	AVENAL	RIVERSIDE
Contracts/Contingencies	\$ 112,175,804	\$ 106,289,825	\$ 135,420,860	\$ 96,882,004
CDC Agency Retained	14,356,477	6,276,705	3,747,661	3,448,266
Project Administration	9,212,078	8,818,223	8,631,025	8,464,303
Architectural/Engineering	6,989,537	8,293,818	10,459,072	6,477,958
Equipment	6,633,799	4,649,508	7,062,166	7,150,000
Previously Expended	2,859,000	2,375,251	0	1,700,000
Long Lead	6,071,185	4,552,670	1,358,356	1,031,585
Acquisition	343,500	1,500,000	2,444,000	1,204,000
Mitigation Fees	0	0	(1,564,210)	0
PIA Reimbursement	(290,516)	0	(6,284,065)	(1,728,874)
Totals	\$158,350,864	\$142,756,000	\$161,274,865	\$124,629,242

Based on an analysis of the amounts approved by the Public Works Board for each prison, we identified the following relationships as unusual and performed testing of the related prison's costs to verify that there are valid reasons for the differences:

Contracts/Contingencies - Amounts are generally comparable based on size and level of the facility except for the Amador prison, which is similar to the

San Diego prison even though Amador is approximately 25 percent smaller than San Diego. In general, this was caused by:

- More change orders occurred at Amador based on our review of change orders paid for Amador and San Diego
- Site work at Amador was approximately \$2 million higher than at San Diego as the land purchased for Amador was near mountainous/hilly terrain
- Competitive bids were solicited for Amador nearly two years later than at San Diego and general cost increases had occurred.

CDC Agency Retained - Each prison requires certain atypical, additional costs which are not similar to other prisons specifically.

Architectural/Engineering - Variances in costs among the prisons occur due to changes in scope and design. These costs usually approximate 7 percent of total construction costs but can fluctuate depending upon scope and/or design changes.

Equipment - Equipment costs at San Diego and Riverside are, on a relative basis, higher than the other prisons. In general, this is because San Diego's actual costs are approximately \$1.5 million less than the approved amount, and Riverside's actual costs currently being approximately \$2 million less than the approved amount. After consideration of these factors, the amounts are comparable on a relative basis, as expected.

Previously Expended - Previously expended costs also can be considered "sunk costs" which, although incurred, are not directly related to the present design and construction costs. For example, San Diego incurred certain architectural and engineering costs before the design of the prison was changed. The CDC classifies this as a "sunk" or previously expended cost. In cases where no design or other changes are made prior to actual construction, there will be no previously expended costs. These amounts are generally comparable except at Avenal, where no significant site and advance architectural and engineering design changes occurred.

Long Lead - Relationships between facilities appear reasonable based on the fact that for Level III facilities, electronic console units are needed with related cell doors, in addition to toilet combo units. For Level II facilities, only toilet combo units are required and, based on our testing, toilet combo units cost approximately \$1,000,000 per 2,000 cell units.

Acquisition - San Diego's cost is substantially less than that of the other prisons. This is because the CDC already owned the land at San Diego. Land had to be purchased for other facilities.

PIA Reimbursement - These reimbursable amounts vary among prison projects based on the amount of construction work that a contractor performs for the PIA. The CDC is reimbursed for these costs.

Mitigation Fees - At Avenal, some of the design and construction work included improving the waste/water treatment plant as part of a joint agreement with the city. The city was then to reimburse the CDC for its share of the costs. This situation was unique to Avenal and does not affect the other prisons.

We also compared the 1984 Facilities Master Plan budget, dated May 2, 1984, of the San Diego prison (approximately \$138 million) to the actual costs at December 31, 1988 (approximately \$158 million) and identified the following areas as having significant differences between the original budget and actual costs.

- Construction Contracts/Contingencies - Actual costs exceeded the budget by approximately \$15 million. This was caused by design phase cost escalations and various change orders relating to the actual construction of the prison.
- Construction Management - Actual costs exceeded the budget by approximately \$1.5 million due primarily to the length of the project in San Diego (i.e. the project was estimated to require a construction manager for approximately 2.5 years from design to finish and the construction manager billed CDC significant amounts for approximately four years).

Our primary purpose in comparing budgeted costs to actual was to search for any items which appeared significantly under budget, as this could indicate that not all costs were recorded. As the major variances were cost overruns, no significant investigations were necessary.

On January 11, 1989, we toured the San Diego prison in order to compare our review of significant contracts and other supporting source documents with on-site observations of the buildings and capital equipment. Based on the tour and our review of the supporting source documents, we noted no significant capital items which did not correlate with our review of contracts and source documents. However, there were certain costs (amounting to less than \$300,000) which were paid for from the operating and maintenance funds of the institution itself which may be considered capital outlay costs (e.g., sidewalks, utility hook-ups, landscaping, etc.). The CDC had included certain of these costs in its capital outlay budget.

As noted in Section A, above, invoices from Heery/Vanir and Kitchell CEM typically include charges for more than one prison. In Section A, we were unable to verify that the amounts charged to the San Diego prison were for work performed for this prison.

Conversely, as it relates to this phase of our testing we were unable to conclude if more costs from these invoices should have been allocated to the San Diego prison.

Based on our analysis of the capital outlay costs of the San Diego prison, as compiled by the CDC, and our testing as described above, we found that on an overall basis the capital costs as shown in Exhibit I-1 are complete. However, there is an outstanding claim of \$1.8 million from a contractor for the cogeneration plant built at the San Diego prison. This amount exceeds the PWB approved amount at December 31, 1988. The CDC is disputing the amount, and at this time any potential payment cannot be quantified. If the CDC is required to pay on this claim, the claim settlement should be added to the cost of the San Diego prison.

C. Conclusion

On an overall basis, capital outlay costs, as compiled by the CDC, are accurate, complete, and adequately supported by source documentation. Approximately \$1.27 million of capital outlay costs of the prison were allocations of invoices from the construction and program managers. We could not verify that the allocation reflected actual work performed on the San Diego prison.

There is an outstanding claim of \$1.8 million from a contractor for the cogeneration plant built at the San Diego prison. The CDC is disputing the amount, and at this time any potential payment cannot be quantified. If the CDC is required to pay on this claim, the claim settlement should be added to the cost of the San Diego prison.

D. Recommendations

1. Construction Management Contract - The contract with Heery/Vanir is not clear as to how indirect labor charges are to be allocated among the different prisons. Heery/Vanir presently bills charges based on the proportion of direct labor charges for the various projects. In the future, contracts with construction management contractors should specify the methodology for charging each prison for labor hours of personnel who work on various prisons.

2. Budget Preparation - In determining what the actual budget was for the San Diego prison, we encountered difficulties in obtaining an original budget. In order to monitor and assess the status of projects, we recommend that the CDC designate one original budget and not modify this budget during the prison project.

II.

**CAPITAL COSTS FOR SAN DIEGO WERE NOT
EXCESSIVE WHEN COMPARED TO OTHER
MEDIUM SECURITY PRISONS**

When compared to seven other Level III prisons recently constructed, the San Diego prison has the second lowest per bed cost (\$61,368) which is 5.1 percent below the average (\$64,672). None of the seven prisons reviewed met the original construction cost target of \$50,000 per bed for the San Diego prison.

A. Background

As set forth in the Office of the Auditor General's May 1985 report, *The State Has Had Problems In Planning and Designing the San Diego Prison*, the California Department of Corrections had considerable early problems in developing a proposed program for the San Diego prison which was satisfactory to the Legislature. In 1983 the Legislature authorized the addition of 500 cells to the facility for a total capacity of 2,200 beds. The CDC estimated the total cost of the 2,200 bed facility to be \$194 million.

At the request of the CDC, Kitchell CEM was authorized to study ways to reduce construction costs for new prisons. In September 1983, the Legislature authorized the addition of the 500 cells and set a limit on the construction cost of the prison at \$50,000 per bed excluding the cost of equipment and off-site utilities.^{1/} The adjusted cost per bed is computed based upon total costs less off-site costs and CDC moveable equipment, divided by the number of design beds.

In April 1984, and as set forth in the 1984 Facilities Plan dated May 2, 1984, the CDC estimated the cost of the prison to be \$138.87 million. The adjusted cost per bed is \$53,954 after deducting off-site construction and movable equipment costs based on Senate Bill 422. In January 1985, the Joint Legislative Prison Committee approved an increased expenditure of \$55,000 per bed. The addition of telecommunications equipment (Governor's Proposed Budget 1986-1987) raised the adjusted authorized budget cost per

^{1/} See Senate Bill 422, Presley 1983 and the Office of Auditor General's May 1985 report, *The State Has Had Problems In Planning and Designing the San Diego Prison*.

bed to \$54,321. The addition of \$2,009,000 in off-site requirements in September 1986 increased the authorized budget of the San Diego Prison to \$144,085,000 but did not change the authorized cost per bed of \$54,321. **Exhibit II-1**, following this page, is a history of budget estimates for the San Diego prison.

As of May 1985, the date of the Auditor General's Report, the Department estimated the prison cost at \$138,719,000, including \$2,859,000 in prior years' expenditures (sunk costs). Kitchell estimated in March 1985 that the cost would be \$141,521,000.

In June 1986, Kitchell estimated the cost at \$145,568,000 and an adjusted cost per bed of \$58,102. As of the end of 1988, the CDC in its December 31, 1988 Capital Outlay Report estimated the cost of San Diego prison to be \$158,351,000, a 9.9 percent increase over the \$144,085,000 authorized in September of 1986. The final adjusted cost per bed is now estimated to be \$61,386 (See **Exhibit II-2**, following **Exhibit II-1**).

**B. The Capital Costs for the San
 Diego Prison Were Not Excessive
 When Compared to Other
 California Level III Facilities**

When compared to other Level III facilities in California, San Diego prison capital costs were not excessive and are nearly the lowest of any Level III facility if sunk costs applicable to prior programs are excluded. San Diego construction cost per bed is \$61,386. The basis for comparing construction costs to other California prisons is based on Senate Bill 422. To arrive at a cost per bed based on Senate Bill 422, certain costs are deducted. These costs include off-site utility, movable equipment, and costs associated with double-celling. The final cost per bed of the San Diego facility (using SB 422 guidelines) is the second lowest of seven facilities and is 5.1 percent below the average of seven comparable prisons.

**SAN DIEGO PRISON
ORIGINAL BUDGET ESTIMATE
COST PER BED**

CDC BUDGET ESTIMATE	COST IN THOUSANDS	COST PER BED (2200 BEDS)
1984 Total Estimated Cost	\$138,719	
Less Non-SB 422 Items and Sunk Costs:		
Site Acquisition Administrative Costs	(560)	
Off-site Development and Utilities	(8,000)	
Moveable Equipment	(8,600)	
Previously Expended for Planning and Design	<u>(2,859)</u>	
TOTAL ON-SITE CONSTRUCTION COSTS	\$118,700	\$53,954
1985 Total Estimated Cost (4/17/85)	\$118,700	\$53,954
1986 Total Estimated Cost (3/27/86)	\$142,076	
Less Non-SB 422 Items and Sunk Costs:		
Site Acquisition Administrative Costs	(560)	
Off-site Development and Utilities	(8,000)	
Moveable Equipment	(8,600)	
Previously Expended for Planning and Design	(2,859)	
Off-site Sewer Development Fees	(2,500)	
On-site Sewer Study	<u>(50)</u>	
TOTAL ON-SITE CONSTRUCTION COSTS	\$119,507	\$54,321
1986 Total Estimated Cost With Offsite Additions 9/86		
Total Authorized Cost (3/27/86)	\$142,076	
Ch. 1393 Off-site Costs (9/86)	<u>2,009</u>	
Total Budget Authorizations	\$144,085	
Less Non-SB 422 Items and Sunk Costs:		
Site Acquisition Administrative Costs	(560)	
Off-site Development and Utilities	(8,000)	
Moveable Equipment	(8,600)	
Previously Expended for Planning and Design	(2,859)	
Off-site Sewer Development Fees	(2,500)	
On-site Sewer Study	(50)	
Chapter 1393 Additional Off-site	<u>(2,009)</u>	
TOTAL ON-SITE CONSTRUCTION COSTS	\$119,507	\$54,321

**SAN DIEGO PRISON
FINAL ESTIMATE
COST PER BED**

	KITCHELL COST CONTROL REPORT		CDC FINAL COST ESTIMATE DECEMBER 1988
	NO. 16 JUNE 1986	NO. 21 NOVEMBER 1986	
Total Estimated Final Cost	\$145,568.0	\$154,308.8	\$158,350.9
Less Non-SB422 Items and Sunk Costs:			
Sewer Easements	\$ 98.5	\$ 98.5 (b)	\$ 0.0 (c)
County Road Improvements	3,402.0	4,411.0 (b)	5,670.4 (c)
Sewer Service Agreement	3,867.5	3,867.5 (b)	3,867.5 (c)
Site Acquisition Administrative Costs	214.0	214.0 (b)	343.5 (a)
Movable Equipment	4,200.0	6,404.8 (b)	6,633.8 (a)
Off-site Sewer Improvements	1,461.5	1,461.5 (b)	1,461.5 (a)
Relocation of Waterline	429.0	429.0 (b)	0.0 (c)
Metering of Off-site Utilities	150.0	150.0 (d)	150.0 (d)
Off-site Utility Improvements	312.5	312.5 (d)	312.5 (d)
Previously Expended for Design	2,859.0	2,859.0 (b)	2,859.0 (a)
Oversized On-site Utility (e)	690.0	690.0 (d)	690.0 (d)
Double Cell Embeds and Inst. (e)	300.0	300.0 (d)	300.0 (d)
Temporary Utility and Temporary Trail	60.0	60.0 (d)	60.0 (d)
Off-site Water Improvements	0.0	1,000.0 (b)	1,000.0 (c)
San Diego Reimbursement	(300.0)	(300.0) (b)	(300.0) (c)
Temporary Utility (Pacific Bell/SDG&E)	-	-	(292.3) (c)
Total Non-SB422 Items and Sunk Costs	<u>\$ 17,744.0</u>	<u>\$ 21,957.8</u>	<u>\$ 23,340.5</u>
TOTAL SB422 CONSTRUCTION COST	\$127,824.0	\$132,351.0	\$135,010.0
AVERAGE SB422 COST PER BED	\$58,102.0	\$60,160.0	\$61,368.0
TOTAL COST PER BED	\$66,167.0	\$70,140.0	\$71,978.0

- (a) Source: CDC final budget dated December 31, 1988, as approved by the Public Works Board and Department of Finance on June 24, 1988.
- (b) Source: Kitchell Cost Control Report No. 21, dated November 26, 1986.
- (c) Source: CDC agency retained expenditures and long lead purchases and budgeted to-date.
- (d) Source: Kitchell Cost Control Report No. 16, dated June 23, 1986.
- (e) Source: Kitchell estimate of additional costs for double-bedding, per Cost Control Reports No. 16 and 21.

Table 2, below, compares the adjusted cost per bed for San Diego with seven other California prisons. At the request of the CDC, Kitchell prepared a comparison of cost per bed for various California prisons by security level. We compared San Diego's cost per bed that we calculated with the results of Kitchell's analysis. No prison in California has succeeded in achieving the legislative target of \$50,000 per cell or the \$55,000 per cell later approved for San Diego prison. San Diego's overall performance as a Level III prison is clearly favorable when compared to similar California prisons.

Table 2

**Comparison of Estimated Final Construction
Costs Per Bed for Level III Facilities**

Facility	Cost Per Bed	Percent (Under) or Over Average Cost per Bed	Construction Completion Date
San Diego	\$61,368(a)	(5.1%)	9/87
Amador	66,266(b)	2.5	9/87
Corcoran (Level III)	62,064(b)	(4.0)	5/88
Jamestown	66,528(b)	2.9	2/89
Susanville	69,781(b)	7.9	12/88
Tehachapi	65,388(b)	1.1	2/89
Vacaville	<u>61,308(b)</u>	<u>(5.2)</u>	6/86
Average Cost Per Bed	\$64,672		

(a) Source: Average cost per bed is based upon the CDC Capital Outlay Report of December 31, 1988. Previously expended costs are excluded. See Exhibit II-2.

(b) Source: Costs per bed are based upon a Kitchell produced study, CDC Summary of New Prison Construction, November 17, 1988. Previously expended costs are excluded.

C. Capital Costs for San Diego
Prison Were Not Excessive When
Compared to Facilities in Other
States

To further assess the reasonableness of capital expenditures for the San Diego prison, we compared its estimated cost per bed to the cost per bed of prisons built in other states. For comparison to the State Prison at San Diego, we reviewed new prison construction programs in four other states and attempted to identify comparable prison facilities. We selected the following states based on the assumption that states with large populations might have new prison construction programs comparable to California:

- Arizona
- Illinois
- Michigan
- Texas.

The information regarding new prison construction in other states was gathered from telephone interviews of personnel within the respective departments of corrections, and from two Architect/Engineering firms working for different states. Unfortunately, using telephone interviews and correspondence did not allow us to perform as rigorous an examination of these programs as we did with the California new prison construction program.

Although California's new prison program is the largest in the nation, many states are building new prison facilities to accommodate their growing prison population. Nevertheless, a great deal of weight cannot be put on a comparison between California's prison program and programs in other states because it is difficult to make meaningful comparisons between individual prison facilities.

As a comparison, we calculated the cost per bed and cost per cell of four other state prisons. Table 3, on the next page, presents the results of this analysis.

Table 3

**Cost Per Bed and Cell Comparison of San Diego
and New Prisons in Four Other States**

State Prison	Design Bed Capacity	Actual Cells	Current Budget (000)	Cost Per Bed	Cost Per Cell
San Diego (California)	2,200	2,000	\$158,350	\$71,977	\$79,175
Texas	2,250	1,419	67,133	29,837(b)	47,310(b)
Illinois	896	840	41,000	45,758	48,809
Michigan	528	528	34,692	65,705	65,705
Arizona (a)	250	0	4,892(c)	19,568	N/A

(a) This prison consists of all dormitory housing.

(b) The cost per bed/cell for a prison with a design bed capacity of 2,250 appears relatively low in comparison to San Diego. The State of Texas was under court order to complete the prison and have it occupied by September 15, 1987. This gave the design and construction effort high priority. Also, the State of Texas new prison program does not provide as much vocational, education, recreational, and other support space or as many programs as California does. For example, the architectural area of the Texas prison is 684,381 gross square feet while San Diego has an architectural area of 1,196,506 gross square feet.

(c) The State of Arizona is not required to pay prevailing wage rates and as a result may have lower construction costs.

To present a more complete comparison of design bed capacity, Table 3 includes the actual number of cells in each prison. This is necessary because California counts one bed for every cell (based upon accepted correctional standards) when in reality cells may be designed to have two beds (to accommodate overcrowding). On the other hand, when Texas and Alabama list design bed capacity for a prison, they are counting two beds per cell for a significant percentage of the cells.

The comparison of cost per bed and cost per cell of the above prisons indicates that the capital costs of the San Diego prison are high. However, if the many differences in scope and correctional programs of the new prisons are considered, the cost differences tend to diminish.

In order for a cost per bed or cell comparison to be valid the basis for the costs in each prison being compared must be the similar. We attempted to identify prisons in other states that were comparable to San Diego but there are still significant differences.

A major barrier in comparing new prisons in other states is that other states are not building prisons as large as the prisons in California. Table 3 showed the extreme differences in design bed capacities between San Diego and other state prisons which were started and completed between 1982 and 1988. San Diego is considerably larger than all of the new prison facilities in the states reviewed. The larger scope of San Diego presents more possible obstacles in controlling capital expenditures. A comparison of individual prisons with such wide differences in scope is of limited value.

While Texas has completed two new prisons since 1982 with design bed capacities closer to San Diego than the other states we reviewed, a comparison of Texas prisons to San Diego reveals another problem. States do not all conform to the same correctional design standards. The American Correctional Association has design standards for constructing prisons that many states choose to follow explicitly while other states do not. For instance, unlike California, Texas does not build its new prisons to ACA standards for day room space per inmate. California provides 35 square feet of day room space per inmate whereas Texas only provides 17.5 square feet per inmate.

Comparisons of costs are further complicated by the type and number of industries at the different prisons. The significantly larger inmate population at San Diego requires more and varied types of vocational programs and industries than do the smaller prisons in other states. For instance, San Diego has sixteen different vocational programs and seven different industries. On the other hand, the Texas facility has only six different vocational programs and two industries, and the Michigan facility has three vocational programs and one industry.

Given the above differences between the San Diego prison and the other state prisons it is not readily apparent that the capital cost of San Diego are indeed excessive.

We also compared data related to the operating and life cycle costs of the five prisons. Table 4, on the next page, presents a comparison of cost per inmate and the inmate per staff ratio of San Diego as it compares to the four other states we reviewed.

Table 4

**Inmate Costs and Staffing Comparison of the
San Diego Prison and the Prisons in the Four Other States**

State Prison	Current Inmate Occupancy	Current Staffing Level	Current Budget (000)	Cost Per Inmate	Inmates Per Staff
San Diego (California)	3,245	869	\$158,350	\$48,798	3.73
Texas	2,119	800	67,133	31,681	2.65
Illinois	932	285	41,000	43,991	3.27
Michigan	480	480	34,692	72,275	1.68
Arizona (a)	250	99	4,892(b)	19,568	2.53

(a) This prison consists of all dormitory housing.

(b) The State of Arizona is not required to pay prevailing wage rates and as a result may have lower construction costs.

The inmate populations in Table 3 are the actual number of inmates in each prison. Because of San Diego's design, the prison is able to handle many more inmates than the design capacity. Therefore, if the cost of the prisons is spread over the actual number of inmates that can be housed at an institution, San Diego's capital costs do not appear excessive. The San Diego cost per inmate is in the range of the other state's cost per inmate.

Also, comparing the inmate per staff ratio indicates that while the San Diego prison may have cost more than the average to design and construct, it may not cost as much as the other state prisons to operate per inmate. The San Diego prison has the highest inmate to staff ratio, which is 35 percent over the average of the other states. The design of the San Diego prison allows fewer staff to handle more inmates. Because wages and benefits of prison staff make up the majority of life cycle operating costs, it is likely that the more efficient design of San Diego will lead to lower life cycle costs per inmate than are experienced at the four other state prisons we reviewed.

D. Conclusions

Capital costs for San Diego prison were not excessive when compared to other Level III prisons in California. The final computed cost per bed (according to SB 422) was \$61,368 which is 5.1 percent below the average for all Level III facilities studied.

Capital costs for the San Diego prison compare favorably to the costs of four other state prisons we reviewed. In comparison to other states, we encountered some problems in comparing costs to other states. The obstacles encountered include design capacity, vocational programs, and efficiency in operation. So in order to conduct a comparison, we relied solely on the total cost per actual inmate population. San Diego's cost per inmate is in the range of other states cost per inmate. While San Diego may have higher construction costs, its design may lead to significantly lower life cycle costs. San Diego's inmate to staff ratio is 3.7 and is the highest of all states reviewed. The ratio is 35 percent higher than the average and is likely to lead to lower operating costs.

E. Recommendations

1. The CDC and Kitchell are currently monitoring the cost per bed of prisons in the new prison construction program. It is recommended that the CDC, assisted by its Program Manager, continue to closely monitor, manage and compare the cost per bed of all facilities throughout the program by security level classification.

III.

THE CDC, PROGRAM MANAGER,
CONSTRUCTION MANAGER AND ARCHITECT
COULD NOT HAVE PREVENTED MAJOR COST
OVERRUNS AND DELAYS AND STILL
COMPLY WITH BOTH LEGISLATIVE COST
TARGETS AND CDC CORRECTIONAL
DESIGN STANDARDS

This section of the report compares final estimated costs with the approved CDC budget as initially established for the 2,200-bed program, and identifies individual cost overruns and underruns from the budget for all costs except for construction change orders. The change orders are reviewed in Section IV of this report.

We have reviewed responsibilities for management of the various line items and found that neither the Department, the Program Manager, the Architect, or the Construction Manager could have prevented major cost overruns or delays which were experienced.

In order to develop a basis for analyzing cost overruns, we reconstructed an initial budget based on CDC cost estimates and budget authorizations. A more detailed discussion on the development of the original budget is provided in Section II of this report. The final approved budget developed for this analysis represents budget authorizations through September 29, 1986 and is summarized in Table 5, below.

Table 5
Development of CDC Original Budget For San Diego

Source Document	Budget Date	Authorization
1986-1991 Facilities Plan	May 27, 1986	\$ 142,076,000
Assembly Bill 3139, Chapter 1393	September 29, 1986	<u>2,009,000</u>
TOTAL APPLICABLE CDC BUDGET		\$ 144,085,000

The original CDC budget does not separate project administration and long lead equipment costs from total construction costs. Available details of the CDC original budget are summarized in Table 6, below, and are compared to Kitchell's original estimate dated March 3, 1985 plus additional costs added to the project by Assembly Bill 3139.

Table 6
Comparison of the CDC Original Budget and Kitchell
CEM Original Estimate for the San Diego Prison

Description	CDC Original Budget (000)	Kitchell Original Estimate (000)
Long Lead Equipment	(a)	\$ 7,234
Construction Contracts	(a)	95,085
Contingency	(a)	5,211
TOTAL CONSTRUCTION	\$111,600	\$107,530
Construction Administration	<u>Not Budgeted</u>	<u>\$6,460</u>
TOTAL CONTRACTS	\$111,600	\$113,990
CDC Agency Retained (b)	\$13,366	\$13,239
Moveable Equipment	8,600	8,600
Land Acquisition Administrative Costs	560	206
Architect/Engineer Design Fees	<u>9,959</u>	<u>8,302</u>
TOTAL BUDGET	\$144,085	\$144,337

(a) Long Lead Equipment, Construction Contracts, and Contingency were budgeted as a lump sum of \$111,600.

(b) Includes 1986 addition of \$2 million for off-site water improvements. The amount represents \$1 million for development fees to the Otay Water District and \$1 million to relocate a waterline.

In April 1984, the CDC estimated that the prison would cost \$138.7 million. In a document dated March 3, 1985, Kitchell estimated the cost of the prison to be \$141.5 million. The Kitchell estimate is not directly comparable to the CDC budget because it includes a number of items not mentioned in the CDC budget. The addition to the Kitchell estimate of approved budget authorizations in 1986 brings the CDC budget and the Kitchell

estimate into reasonable agreement but does not permit detailed comparison of construction costs in view of the lack of detail available for the CDC budget.

For purposes of this analysis we have taken the CDC approved budget at \$144,085,000, as confirmed by the CDC, and have developed logical breakdowns of components as developed by Kitchell in the March 3, 1985 original estimate.

The CDC, the Program Manager, and the Construction Manager each prepared separate reports covering areas of their responsibilities. We found that original budgeted amounts and forecasts were not consistent among the three reports which resulted in considerable confusion in understanding the overall budget status. We also found that each report was prepared infrequently resulting in considerable difficulty in reconciling different amounts due to the lack of a common reporting period. Also, the last cost control report prepared by the Program Manager was November 1986.

Table 7, below, compares the estimated final cost of the prison to the CDC approved budget.

Table 7
Comparison of Estimated Final Costs to Budget

Description	CDC Original Budget (000)	Final Estimated (December 1988) (000)	Amount (Under) or Over Budget (000)	Percent (Under) or Over Budget
Project Administration	\$ 6,460 (a)	\$ 9,212	\$ 2,752	42.6%
Preliminary Plans	2,000	2,807	807	40.4
Previously Expended (b)	2,859	2,859	--	0.0
Long Lead Equipment	7,234 (c)	6,071	(1,163)	(16.1)
Movable Equipment	8,600	6,634	(1,966)	(22.9)
Land Acquisition Administrative Costs	560	344	(216)	(38.6)
CDC Agency Retained	13,366 (d)	14,356	990	7.4
Working Drawings	5,100	4,182	(918)	(1.8)
Construction Contracts	97,906	112,176 (e)	14,270	14.6
PIA Reimbursement	--	(290)	(290)	0
TOTALS	144,085	158,351	14,266	9.9%

(a) Project Administration was not detailed in CDC original budget. This number is from Kitchell's March 1985 estimate.

(b) Previously expended costs represent amounts spent in the planning and design of a prior program which was abandoned because construction costs were too high.

(c) Long lead equipment was not detailed in CDC original budget. This number is from Kitchell's March 1985 estimate.

(d) CDC agency retained budget includes budget from the 1986-91 Master Plan, dated May 1986, and \$2 million for additional off-site improvements authorized by Chapter 1393 in September 1986.

(e) Includes \$429,584 paid to Otay Water district for removal and relocation of water line.

Exhibit III-1, on the following page, provides a listing of various budgeted activities by management responsibility, as assigned by the CDC. Each area of responsibility was reviewed to identify where underruns and overruns occurred, and the results are presented in the subsections which follow.

A. CDC Managed Costs Were Not Excessive

The CDC Planning and Construction Division is responsible for the purchase of movable equipment, CDC agency retained items (e.g. off-site costs, furnishings, local government expenses), and other miscellaneous items. The CDC receives little or no assistance from either the Program Manager, the Contract Manager, or the Architect/Engineer for these expenditures, except for the off-site sewer and road.

Estimated final costs are 5.3 percent below the approved budget for items directly managed by CDC. Of this variance, there was a significant increase of \$990,000 in CDC agency retained items. Examples of items that appear under this cost category include:

- Construction of the Otay Mesa Road near and surrounding the prison which cost approximately \$5.7 million
- Installation of required water and sewer lines which cost approximately \$4.9 million
- Installation of an electronic and communication system costing \$1.4 million

Amounts expended for moveable equipment was \$2 million under budget. The favorable budget variance was achieved by not having to purchase all items listed on the CDC standard equipment list. Because not all equipment budgeted was required at San Diego, a substantial savings was realized.

We also reviewed and discussed with CDC personnel each material expenditure under CDC responsibility. From our review of major expenditures, we found the costs under direct management of the CDC were not excessive and amounts were not avoidable.

**COMPARISON OF FINAL ESTIMATE TO BUDGET
BY MANAGEMENT RESPONSIBILITY**

DESCRIPTION	CDC ORIGINAL BUDGET (000)	12/31/88 FINAL ESTIMATED COST (000)	(UNDER) OR OVER (000)	PERCENT DIFFERENCE
Movable Equipment	\$ 8,600	\$ 6,634	\$ (1,966)	(22.9)%
CDC Agency Retained	13,366	14,356	990	7.4
Administrative Land Cost	<u>560</u>	<u>344</u>	<u>(216)</u>	<u>(38.6)%</u>
TOTAL CDC MANAGED	\$ 22,526	\$ 21,334	\$ (1,192)	(5.3)%
Preliminary Plans	\$ 2,000	\$ 2,807	\$ 807	40.4%
Previously Spent on Planning	2,859	2,859	-	0.0
Drawings and Support	<u>5,100</u>	<u>4,182</u>	<u>(918)</u>	<u>(18)</u>
TOTAL DESIGN	\$ 9,959	\$ 9,848	\$ (111)	(1.1)%
LONG LEAD EQUIPMENT	\$ 7,234	\$ 6,071	\$ (1,163)	(16.1)%
Program Manager	\$ 2,186	\$ 2,435	\$ 249	11.4%
Construction Manager	1,893	3,904	2,011	106.2
Office State Architect	1,809	2,004	195	10.8
Other Consultants	<u>572</u>	<u>869</u>	<u>297</u>	<u>51.9</u>
TOTAL ADMINISTRATION	\$ 6,460	\$ 9,212	\$ 2,752	42.6%
Construction Contracts	\$ 97,906	\$112,176	\$ 14,270	14.6%
PIA Reimbursements	<u> </u>	<u>(290)</u>	<u>(290)</u>	<u>0.0</u>
TOTAL CONTRACTS	\$ 97,906	\$111,886	\$ 13,980	14.3%
GRAND TOTAL	\$144,085	\$158,351	\$ 14,266	9.9%

**B. Design Costs Are Reasonable Compared to
Other California Prisons**

Design costs include preliminary drawings, detailed drawings and specifications, consultant fees, and design support during construction. Total design costs also include \$2,859,000 previously spent in planning for a prior program which was abandoned because construction costs were determined to be too high. The plans developed for the previous design were abandoned and the lower cost design was subsequently adopted.

The \$6,989,000 design costs applicable to the revised program (total design costs of \$9,848,000 less \$2,859,000 previously expended) are 6.2 percent of final construction contract costs. Table 8, below, compares San Diego's design costs with six other prisons, as estimated by Kitchell.

Table 8
Comparison of San Diego Prison Design Costs
With Other California Prisons

California Prison	Design Costs as a Percent of Construction Contracts (a)
San Diego	6.2%
Del Norte	6.2
Corcoran	5.1
Amador	7.6
Riverside	6.4
Tehachapi	6.8
Avenal	<u>8.1</u>
AVERAGE SIX PRISONS	6.6%

(a) Excludes amounts previously expended for prior programs.

The San Diego design fees, less prior program expenditures, compare reasonably to other California prisons. The Corcoran facility design costs are low because of substantial savings from the use of drawings from previous projects.

The \$2,859,000 previously spent in planning for a prior program could have been saved by implementing the original design which was estimated to cost \$194,000,000. However, a legislative and management decision to reduce construction costs through a proactive cost reduction program proved effective in reducing the final cost of the prison to \$158,351,000. The reduction in costs is in spite of a 9.9 percent variance over the original budgeted construction amount of \$55,000 per bed.

The \$2.9 million in sunk costs, as a result of abandoning the more expensive \$194 million design, was a cost necessary to implement a redesign of the San Diego prison. The abandonment of the more expensive design was successful in substantially reducing total cost of the prison from \$194 million to \$158 million.

The organization of the prison construction program has changed drastically from the early days when the initial design program for the San Diego prison was formulated. We have developed no new assessment of responsibility for the initial program. See the Office of Auditor General's May 1985 report, *The State has had Problems in Planning and Designing the San Diego Prison*.

Some inefficiency in design was undoubtedly experienced due to the substantial pressure put upon the architect to minimize design time so that bids could be requested as early as possible and for implementation of evolving correctional design standards. However, because the overall design cost was a favorable 6.2 percent of total construction costs, such inefficiencies may not be material. One exception may be the duplication of electrical design costs due to implementation of a localized security control system.

C. Long Lead Equipment Equipment Costs
Were Not Excessive

Long lead equipment primarily includes the purchase of cell doors, control console units, and bathroom combination units. The term "long lead" refers to the amount of advance time required to obtain the items to coordinate the construction schedule. Long lead items are purchased by the CDC based on lists of equipment requirements prepared by Program Manager and the Architect/Engineer.

Estimated final equipment costs are 16.1 percent below the approved budget. An analysis of one change order (number 10, Bid Package SD-6), indicated that the electrical switchgear which should have been pre-purchased, was purchased from a contractor for \$422,681 as a matter of convenience to expedite its delivery. If this item had been pre-purchased by the CDC, the underrun would have been reduced to \$740,000 or 10.2 percent.

In addition to the comparison, we also examined all purchase orders and invoices and conducted interviews of CDC personnel regarding the cost item. We found no costs to be avoidable or preventable.

D. **There Was a Substantial Overage in Project
Administration Costs But It Was Not
Avoidable**

Project administration costs are for services provided by the Program Manager, Construction Manager, the Office of State Architect, and for other consultants. Kitchell, the Program Manager, provides engineering services for detailed execution of the project from the initial planning through award of the final construction contract. Heery/Vanir, the Construction Manager, provides construction management services during the construction phase of the prison. The Office of the State Architect provides the on-site construction inspection. The CDC provides oversight responsibility for the prison construction program but their internal administrative costs are not budgeted or allocated to specific prisons.

As shown in Exhibit III-1, total administration costs exceeded the CDC final budget by 42 percent. Budgeted Construction Manager fees were exceeded by 106.2 percent, Program Manager fees were exceeded by 11.4 percent, and Office of the State Architect fees by 10.8 percent.

Program management costs for the San Diego prison totaled \$2.4 million. Table 9, below, illustrates the relative range of budget variances for project administrative fees for six California prisons.

Table 9
Comparison of San Diego Prison Program Management Costs
With Other California Prisons (a)

California Prison	Program Management Costs (000)	Total Construction Contracts (000)	Percent of Construction Contracts	Percent Over/(Under) Budgeted Amount
San Diego	\$2,435	\$112,176	2.2%	11.4%
Amador	1,748	114,101	1.5	(20.9)
Corcoran	3,018	177,208	1.7	9.3
Avenal	1,856	133,348	1.4	(30.5)
Riverside	1,497	107,917	1.4	(2.9)
Sacramento	1,359	123,331	1.1	11.5
TOTAL	\$11,913	\$768,081		
AVERAGE	\$1,986	\$128,014	1.6%	(5.4%)

(a) All values except Sacramento's are from the latest Kitchell Cost Control Reports. Sacramento's numbers are from the Budgetary Control Summary dated June 30, 1988.

The average program administration cost for the six prisons is 1.6 percent of contract value. Program administration costs for the San Diego prison were 2.2 percent of total prison costs. The increased cost primarily is due to an extensive value engineering program which resulted in reducing the total cost of the prison from an initial cost estimate of \$194 million to a final cost of \$158 million. Because the value engineering program was successful in reducing the total cost of the prison, the higher program management fees appear to be warranted.

Construction Management costs are presented below in Table 10. San Diego construction management fees exceeded the budget by 106 percent. Table 10 compares the construction management fees for six prisons. Construction management fees averaged 3.6 percent of contract value. The San Diego prison ran 3.5 percent.

Table 10
Comparison of San Diego Prison Construction Management Costs
With Other California Prisons (a)

California Prison	Construction Management Costs (000)	Total Construction Contracts (000)	Percent of Construction Contracts	Percent Over Budgeted Amount
San Diego	\$3,904	\$112,176	3.5%	106.2%
Amador	4,056	114,101	3.6	101.6
Corcoran	7,990	177,208	4.5	74.1
Avenal	3,532	133,348	2.6	120.3
Riverside	2,638	107,917	2.4	14.4
Sacramento	5,649	123,331	4.6	97.4
TOTAL	\$27,769	\$768,081		
AVERAGE	\$4,628	\$128,014	3.6%	81.9%

(a) All values except Sacramento's are from the latest Kitchell Cost Control Reports. Sacramento's numbers are from the Budgetary Control Summary dated June 30, 1988.

The table lists construction management fees for six prisons. A reason for this is how contract management fees were budgeted. An early estimate of 1.7 percent from Vacaville was reportedly used as a basis for construction management cost estimates on several prisons including San Diego.

As shown in Table 10, the average variance from budget was 82 percent. It appears that the construction management fees for a number of prisons were similarly under estimated. Because San Diego's construction management costs was in the relevant range of the five other prisons, it was determined that San Diego's fees were reasonable. In our review and discussion with Project Management and CDC personnel, we found no costs to be avoidable.

Total San Diego construction inspection fees by the Office of the State Architect totaled \$2.0 million, or 10.8 percent over the budgeted amount. Table 11, below, compares San Diego's construction inspection fees to five other prisons.

Table 11
Comparison of San Diego Prison Construction Inspection Costs
With Other California Prisons (a)

California Prison	Construction Inspection Costs (000)	Total Construction Contracts (000)	Percent of Construction Contracts	Percent Over Budgeted Amount
San Diego	\$2,004	\$112,176	1.8%	10.8%
Amador	1,999	114,101	1.8	0.0
Corcoran	3,497	177,208	2.0	2.9
Avenal	2,700	133,348	2.0	61.7
Riverside	2,248	107,917	1.9	10.9
Sacramento	2,365	123,331	1.9	81.5
TOTAL	\$14,813	\$768,081		
AVERAGE	\$2,469	\$128,014	1.9%	20.9%

(a) All values except Sacramento's are from the latest Kitchell Cost Control Reports. Sacramento's numbers are from the Budgetary Control Summary dated June 30, 1988.

San Diego's fee was 1.8 percent of total contract value. This was lower than the 2.0 percent at Corcoran and Avenal. San Diego's fee also was lower than the 1.9 percent average. Because its fees were lower as a percentage of total contract value, San Diego's costs appeared reasonable. Additionally, we also reviewed invoices from the Office of the State Architect. No construction inspection costs were found in our review to be avoidable.

E. The CDC, Program Manager, Construction Manager, and Architect Could Not Have Prevented Design Phase Cost Overruns and Still Comply with CDC's Design Criteria

The cost overrun for field construction contracts for the San Diego prison is estimated at \$13.98 million. The cause of the budget variance can be divided into two phases:

• Design phase	\$ 6,170,000
• Construction phase	<u>7,810,000</u>
Total Overrun	\$13,980,000

The variance in the design phase represents cost escalation during the design. The construction phase variance represents costs which resulted from change orders. This subsection discusses the overrun during the design phase. Construction phase variances, or change orders, are discussed in further detail in Section IV of this report.

Design phase and construction phase variances for the San Diego prison are presented below in Table 12.

Table 12
San Diego Design Phase and Construction Phase Variance

Construction Contracts, As Awarded	\$104,076,000
Construction Contracts, As Originally Budgeted	<u>97,906,000</u>
DESIGN PHASE INCREASE	\$ 6,170,000
Final Estimated Construction Cost with Contingency (a)	\$111,886,000 (b)
Construction Contracts, As Awarded	<u>104,076,000</u>
CONSTRUCTION PHASE INCREASE	\$ <u>7,810,000</u>
TOTAL CONSTRUCTION CONTRACT INCREASE	\$ 13,980,000

(a) The contingency represents amounts actually expended for unforeseen changes and additions which occurred during the course of construction.

(b) Total construction less a credit of \$290,000 for PIA improvements. The amount also excludes \$429,584 paid to the Otay Water District for the relocation of a water line.

It was noted in the May 1985 report by the Office of the Auditor General that there were problems in the planning and design of the San Diego prison. The initial design of the San Diego prison was determined to be too costly and a second design was prepared. During the second design phase of the prison several factors impacted this design. In 1983, the legislature established a construction cost limitation of \$50,000 per bed. The original budget was therefore prepared to meet the targeted costs. In 1985, the Joint Legislative Prison Committee increased the construction cost limitation to \$55,000 per bed.

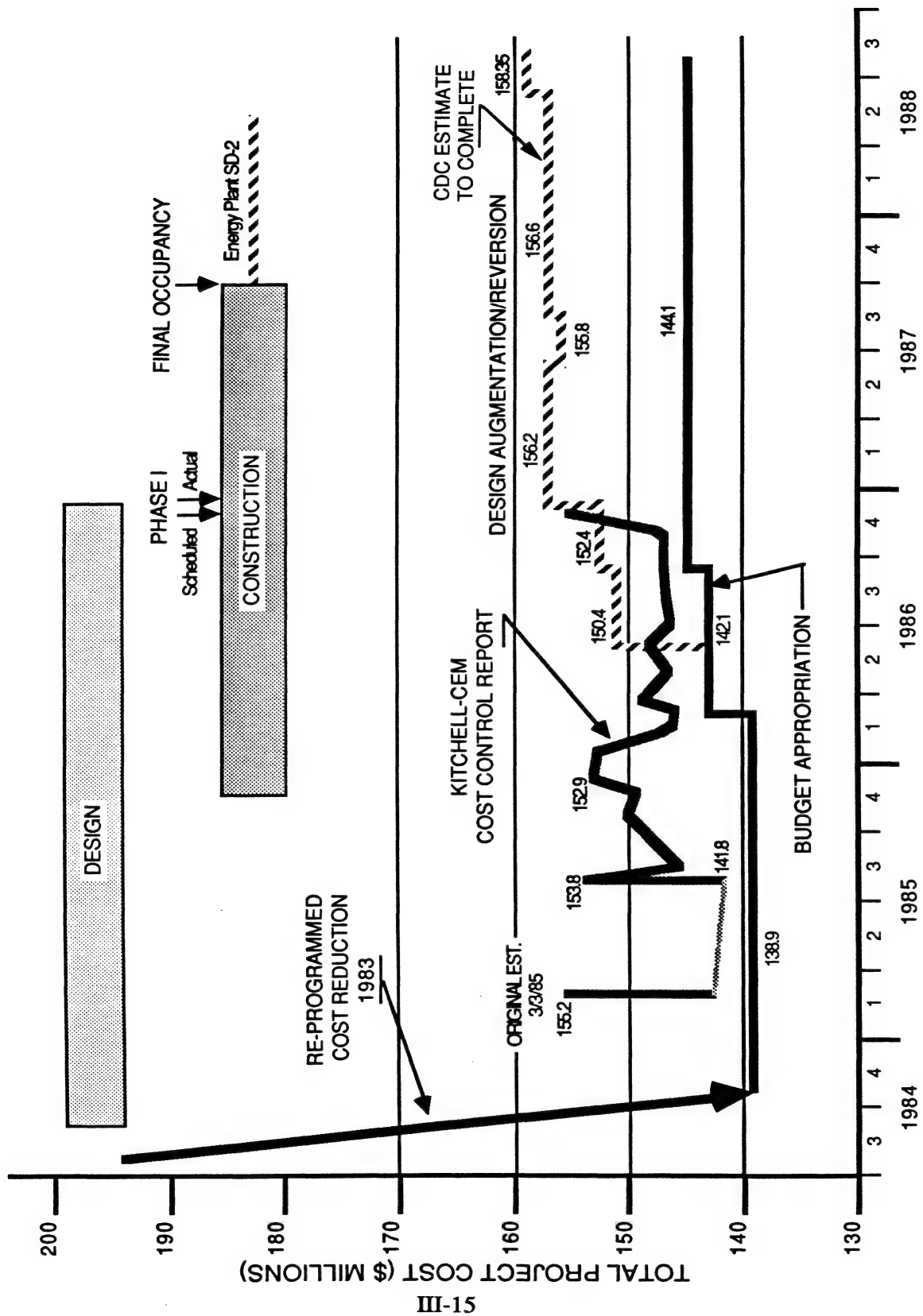
The original budget for the San Diego prison was prepared in response to a targeted cost of \$50,000 per bed as discussed in Section III of this report. The Kitchell budget of March 3, 1985 was prepared to comply with a \$55,000 cost per bed per the Joint Legislative Prison Committee.

At this time estimates for administrative, long lead equipment, design, CDC equipment and reserved costs were completed and have been incorporated into approved budgets. The task of reducing a \$194 million estimate for a 2,200-bed prison to the targeted \$50,000 per bed figure did not address these costs (estimated at \$46.2 million) and a massive effort was made to realize the decreases from the remaining on-site facility costs of construction.

It is apparent that there was a considerable effort made by Kitchell and the CDC in the area of value engineering to reduce construction costs. This extensive attempt was to assist the CDC in achieving their original budget. **Exhibit III-2**, following this page, illustrates the resulting changes over time in cost forecasts, compared with the budget appropriation.

Given the limitation on construction costs, the CDC and Kitchell made a considerable effort to comply with the legislative target. Kitchell was consulted to implement a value engineering program to evaluate ways whereby construction costs could be minimized to meet the \$55,000 per bed limitation. From our review, we noted that there were three major cycles of cost reduction forecasts in order to attempt to meet the target.

SAN DIEGO PRISON COMPARISON OF FORECASTED COST AND PROJECT BUDGET



The compilation of the CDC *Design Criteria Manual* was not completed at the time of the San Diego redesign even though San Diego's design was to be consistent with the correctional standards that were yet to be developed. Because these standards were not yet determined during San Diego's original budgeting, the CDC initial budget would not have included the additional costs required to meet the correctional standards.

In retrospect, compliance with the \$55,000 per bed target proved impossible to meet and still comply with prison design standards which were developed during the design of San Diego. The current final estimated adjusted cost per bed of the prison is \$61,368, or 5.8 percent below the average of seven comparable medium security facilities. It is only slightly higher than the lowest cost per bed of \$61,308 which was achieved at the Vacaville facility.

F. The CDC, Program Manager, Construction Manager and Architect Could Not Have Prevented an Eighteen Month Delay From the Original Schedule

Once the decision was made to reduce the total cost of the facility to comply with the legislative target, preservation of original schedules was not possible because the CDC would have to embark on a new design program in order to reduce the construction cost to \$50,000 per cell as limited by Senate Bill 422. To implement the legislative limit of \$50,000 per cell, the San Diego prison had to undergo both a value engineering study and a redesign. Both of these processes required an eighteen month extension to the original schedule. This delay represents a trade-off between the cost savings realized and time. The decision mandated by the legislature resulted in a savings of approximately \$36 million, the difference between the original construction estimate of \$194 million and the current final cost of \$158 million.

Presented below in Table 13 is a comparison of construction periods of other comparable prisons. The San Diego prison was planned to be constructed in seventeen months. The actual construction period of the San Diego prison was twenty-two months, which appears satisfactory. The schedule slippage of five months, however, represents a 28 percent difference. Though the percentage is higher than most of the prisons listed, the initial schedule of seventeen months appears to be overly optimistic. No prison had a construction period of less than twenty-one months. The Riverside facility, which was scheduled for sixteen months, was similarly extended to twenty-two months.

Table 13
Major Prison Program Schedules
Planned vs. Actual

Facility	Actual Start	Completion Dates Planned	Actual	Construction Schedule (Months)		Months Late (Early)	Percent Diff.
				Planned	Actual		
Amador	12/85	9/87	9/87	21	21	0	0%
Avenal	12/85	12/87	10/87	24	22	(2)	(8)
Corcoran	8/86	12/88	2/89	28	30	2	7
Riverside	5/87(a)	9/88	3/89	16	22	6	38
Sacramento	10/84	2/87	4/87(b)	28	30	2	7
San Diego	<u>11/85</u>	<u>4/87</u>	<u>9/87</u>	<u>17</u>	<u>22</u>	<u>5</u>	<u>29</u>
TOTAL				134	147	13	
AVERAGE DURATION				22.3	24.5	2.2	10%

- (a) There was a two-month delay from ground breaking until actual start (reported by Kitchell). Construction difficulties also contributed to delay.
- (b) Actual completion ready for building occupancy was assumed on 4/87, per 1987 plan. Security system problems and final work continued until 9/87. We used 4/87 as beneficial and actual occupancy, or 30 months to complete.

G. Conclusions

The CDC Program Manager, Construction Manager, and Architect could not have prevented major cost overruns and delays and still comply with both the legislative target and CDC correctional design standards that the Department was developing.

H. Recommendations

1. The CDC should continue the current practice of preparing detailed cost models and schedules which were not yet formalized for the San Diego Prison. Separate contingencies recognizing the preliminary nature of early estimates should be incorporated in the development of budgets prior to approval.
2. Cost Control and Schedule Reports should be issued by the Program Manager on a monthly basis throughout the design and construction phases, as recommended in the Office of the Auditor General's February 1989 report, *An Audit of the California Department of Corrections' Program Management Contractor*.
3. The CDC should review all future projects and establish a common work breakdown structure so that original budgets, actual costs and forecast costs at completion prepared by the Program Manager, the CDC and the Construction Manager are prepared in an integrated manner, consistent with one another. The CDC should assign the responsibility for implementing this recommendation to its Program Manager.

IV.

THE TOTAL COST OF THE SAN DIEGO PRISON
WAS INCREASED DUE TO CHANGES TO
LUMP SUM CONTRACTS ABOVE THE
CONTINGENCY ALLOWED FOR CHANGE
ORDERS

Change orders to fifteen construction contracts are currently forecast to exceed \$7.5 million. These changes will be 7 percent above the contract award value of \$104,076,00 for all contracts.

A portion of the change orders represents changes which could have been avoided by including the work in the original bid packages. The magnitude of the additional cost resulting from work completed under change order provisions can only be approximated in the order of \$250,000.

A contingency is applied by the CDC to construction contracts at the time of award to cover unforeseen changes and additions during construction. This contingency recognizes that design and other changes will occur due to the phased construction approach being used by CDC to minimize the construction schedule. When adjustments are made to reflect work added by change orders outside of the scope of the normal contingency, the experience at the San Diego prison is nearly the same as the contingency allowed. The change order experience at the San Diego prison also is within the range of changes experienced at three other new prison projects.

A. Change Order Experience On the San Diego
Prison

Fifteen construction contracts worth a total of \$104,076,226 were awarded, based on documents prepared by the Architect/Engineer and Program Manager. Upon award, a contingency of about five percent of the awarded amount is added by the CDC to establish a budget for monitoring the progress of the construction work. The contingency provides for unforeseen changes and additions which inevitably occur during the course of the construction.

The CDC used a phased approach to the design and construction of the prison that is similar to what is being used currently on other new prisons. This approach overlaps the design and construction phases in order to accelerate completion of construction and provide for early occupancy of the facilities. Occupancy also is overlapped with construction to benefit from certain facilities as they are completed.

As a result of the overlapping, design for facilities required later in the schedule often is incomplete at the time bid packages for earlier facilities are awarded. Work to coordinate the early and later designs, or to incorporate changed design criteria, is added to existing contracts by change order. The change order process is used to include additional work resulting from design additions and errors, provision of temporary facilities, and other work related to maintaining the schedule. Transfers of work among contracts for scheduling convenience, claim settlements, and other changes to contract provisions also are included as contract change orders.

The initial contingency set by CDC for the San Diego prison totaled \$4,281,330, or 4.1 percent of the total contract award. Two contracts, SD-10 Support Buildings and SD-11 Miscellaneous Buildings, had contingencies of 1.5 percent and 2.4 percent, respectively, which reduced the overall contingency amount from the typical five percent. The Construction Manager was not aware of the reason for the reduced contingency amount set by CDC for these two contracts.

Exhibit IV-1, following this page, lists each contract with the initial contingency amount. The exhibit compares the current estimated contract amount to the award amount including contingency, and calculates the difference. This difference represents estimated "excess" changes beyond the initial contingency. The total contract values are estimated to be seven percent above the total original award value. Based on a contingency allowance of five percent, the excess changes represent two percent of contract award, or \$2,466,183.

In order to assess the areas of greatest change, the Construction Manager's last project report prepared in December 1987 was reviewed. The report lists change orders for each contract along with the change order amount. The reason given by the Contract Manager for the change order also was reviewed.

**SAN DIEGO PRISON CONSTRUCTION
CHANGE ORDER ANALYSIS**

BID PACKAGE NUMBER	DESCRIPTION	ORIGINAL CONTRACT AWARD	INITIAL CONTINGENCY (a)	CONTINGENCY AS PERCENT OF CONSTRUCTION	ORIGINAL CONTRACT WITH INITIAL CONTINGENCY (a)	ESTIMATED FINAL CONSTRUCTION (b)	AMOUNT OVER INITIAL CONTINGENCY	CONTRACT TIME EXTENSION (DAYS) (a)
SD-1	Clear & Grub	\$49,700	\$0	0.00%	\$49,700	\$52,185 (c)	\$2,485	0
SD-1A	Site Grading & Drainage	2,592,189	129,609	5.00%	2,721,798	2,832,750	110,952	75
SD-2	Gas Turbine and Electrical Distribution	3,050,000	152,500	5.00%	3,202,500	3,202,500	0	0
SD-3	Offsite Sewer	1,391,875	69,594	5.00%	1,461,469	1,461,469	0	69
SD-5	Onsite Utilities, Sewer, and Fence	11,045,000	552,250	5.00%	11,597,250	12,057,250	460,000	0
SD-6	Housing, Towers, Sallyport	40,985,000	2,008,265	4.90%	42,993,265	43,589,974	596,709	120
SD-7	Kitchen	2,875,000	140,900	4.90%	3,015,900	3,190,900	175,000	100
SD-8A	PABX	290,000	14,500	5.00%	304,500	304,500	0	213
SD-8	Receiving, Release, and Central Control	1,270,000	63,500	5.00%	1,333,500	1,333,500	0	15
SD-9	Family Visiting	529,700	26,485	5.00%	556,185	556,185	0	66
SD-10	Support Bldgs	14,086,762	216,275	1.54%	14,303,037	14,777,087	474,050	178
SD-10A	Warehouse	2,768,000	138,400	5.00%	2,906,400	3,026,400	120,000	115
SD-11	Miscellaneous Buildings	14,795,000	351,652	2.38%	15,146,652	16,551,625	1,404,973	212
SD-12	Minimum Security Housing	5,350,000	267,500	5.00%	5,617,500	5,661,995	44,495	112
SD-13	Industry Facilities 3 and 4	2,998,000	149,900	5.00%	3,147,900	3,147,900	0	50
	TOTAL CONSTRUCTION CONTRACTS WITH INITIAL CONTINGENCY (As a Percentage of Original Award)	\$104,076,226 100.00%	\$4,281,330 4.11%	4.11%	\$108,357,556 104.11%	\$111,746,220 107.37%	\$3,388,664 3.26%	1,325
	TOTAL CONSTRUCTION CONTRACTS WITH 5 PERCENT CONTINGENCY (As a Percentage of Original Award)	\$104,076,226 100.00%	\$5,203,811 5.00%	5.00%	\$109,280,037 105.00%	\$111,746,220 107.37%	\$2,466,183 2.37%	1,325

(a) Contract Manager Progress Report, dated December, 1987,
plus subsequent change orders and claims.

(b) CDC Capital Outlay Report, dated December, 1988.

(c) Excludes payment to the Otay Water District for \$429,584 to
relocate water line which is included in the CDC Capital
Outlay Report contingency amount.

Exhibit IV-2, following this page, is a summary of the Contract Manager report of actual change orders prepared for use in this study. The exhibit summarizes nearly 500 change orders by each of the fifteen contracts, by reason for change order. The total amount of change orders on this exhibit is different from Exhibit IV-1 because it represents actual change orders to date.

The percentage of changes actually approved currently equals 7.2 percent of the contract award total. Individual contracts have changes ranging up to 13.8 percent. The exhibit does not include any change orders still pending or the one contract claim which is still outstanding.

The larger change orders were reviewed during interviews with project team members from the CDC and from the Architect, Program Management and Construction Management firms. In these reviews, it was noted that there was disagreement with the assigned code categories for many of the change orders. An error or omission from the Contract Manager's perspective may have been outside the original designer's scope, a result of a change in design scope, involved a conscious decision to add work as a contract change to maintain the schedule goals of the project, or a result of interfacing the various design contributors.

**B. Additional Cost to the Project is Estimated to
 Be in the Order of \$250,000**

Work added to construction contracts for omitted original design and owner requests totaled \$4.8 million. It is possible that a large portion of these changes could have been included in the original bid packages had the design of the facility been completed prior to starting construction. The additional cost of adding work during the construction phase as the result of design changes and owner requests is essentially a tradeoff between increased construction costs and schedule acceleration.

For both types of changes, the work represented by the new design or request was not included in the original bid amount by the contractor. The new design represents costs to the project within the original budget criteria. Owner requests are for items outside the original design scope and also may not have been included in the original bid documents.

**SAN DIEGO PRISON CONSTRUCTION
SUMMARY OF APPROVED CHANGE ORDERS**

BID PACKAGE NUMBER	DESCRIPTION	ORIGINAL CONTRACT AWARD	CONTRACT MANAGER CHANGE ORDER CLASSIFICATION							TOTAL APPROVED CHANGE ORDERS	TOTAL AS PERCENT OF ORIGINAL AWARD
			FIELD CONDITION	CONTRACTOR REQUEST	DESIGN ERROR	DESIGN OMMISSION	OWNER REQUEST	OTHER			
SD-1	Clear & Grub	\$49,700	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0.00%
SD-1A	Site Grading & Drainage	2,592,189	228,610	23,500	5,295	0	(20,000)	0	0	237,405	9.16%
SD-2	Gas Turbine and Electrical Distribution	3,050,000	11,755	0	0	12,526	(21,459)	0	0	2,822	0.09%
SD-3	Offsite Sewer	1,391,875	(10,727)	0	(2,067)	17,154	5,131	11,035	11,035	20,526	1.47%
SD-5	Onsite Utilities, Sewer, and Fence	11,045,000	226,112	0	115,861	551,685	172,703	(264,757)	(264,757)	801,604	7.26%
SD-6	Housing, Towers, Sallyport	40,985,000	87,357	73,578	430,724	1,497,482	975,092	2,304	2,304	3,066,537	7.48%
SD-7	Kitchen	2,875,000	9,283	0	106,450	45,632	181,890	0	0	343,255	11.94%
SD-8A	PABX	290,000	2,916	0	0	22,235	0	14,880	14,880	40,031	13.80%
SD-8	Receiving, Release, and Central Control	1,270,000	0	0	1,187	31,831	(2,106)	1,938	1,938	32,850	2.59%
SD-9	Family Visiting	529,700	1,750	0	6,619	12,542	4,940	(300)	(300)	25,551	4.82%
SD-10	Support Bldgs	14,086,762	41,099	(891)	110,801	438,289	(164,788)	211,145	211,145	635,655	4.51%
SD-10A	Warehouse	2,768,000	10,292	0	0	14,431	218,105	3,246	3,246	246,074	8.89%
SD-11	Miscellaneous Buildings	14,795,000	167,240	(800)	622,897	295,076	271,544	308,285	308,285	1,664,242	11.25%
SD-12	Minimum Security Housing	5,350,000	9,950	(12,637)	20,079	182,443	14,495	33,804	33,804	248,134	4.64%
SD-13	Industry Facilities 3 and 4	2,998,000	9,949	46,147	0	30,665	29,553	5,236	5,236	121,550	4.05%
	TOTAL ORIGINAL CONTRACT AND CHANGE ORDERS	\$104,076,226	\$795,586	\$128,897	\$1,417,846	\$3,151,991	\$1,665,100	\$326,816	\$326,816	\$7,486,236	
	TOTAL AS PERCENTAGE OF ORIGINAL CONTRACT AWARD	100.00%	0.76%	0.12%	1.36%	3.03%	1.60%	0.31%	0.31%	7.19%	

Examples of some of these changes which could have been included in the original bids are:

<u>Package</u>	<u>Change</u>
<u>Omissions:</u>	
SD-5	<u>Added Circulating Pumps</u> - Pumps were not in the scope of either the on-site generation contract, SD-2, or site utilities contract, SD-5. Pumps were required and added to the SD-5 contract.
SD-6	<u>Electrical Revisions</u> - Electrical design was delayed due to a decision to change from an integrated information system for control at the prison which was in the original criteria. The decision also involved a change in electrical design consultants. The project team elected to release the bid package to maintain the schedule with the knowledge that the design was not completed.
SD-6	<u>Added Tile at the Showers</u> - The CDC design criteria manual was being developed at the time of San Diego prison design. The designers were instructed to proceed with design and change it later if conflicts with the approved criteria were found. Tile was added to conform with new criteria requirements.
SD-10	<u>Equipment and Gas to Bldg. 2.14</u> - No gas was provided to the building in the original design documents, although it was required. This change was authorized to add the service and equipment.
<u>Owner Request:</u>	
SD-5	<u>Utilities to Temporary Buildings in Facility 3</u> - Temporary buildings were required for early occupancy by the CDC. Utilities to these buildings were required but not shown on the design for the permanent facilities.
SD-6	<u>Purchase of 12 kv Switchgear (material only)</u> - The switchgear was advance-purchased under bid package SD-6 to assure delivery of the equipment prior to its installation under the cogeneration bid package, SD-2. Had the item been purchased in SD-2, there would not have been sufficient lead time for its purchase to provide electrical power during the phased inmate occupancy.
SD-6	<u>Add A/C Units @ 12 Buildings</u> - This change is one of several changes related to moving the

uninterruptable power supply (UPS) into the buildings from a designed location in the yard areas.

- SD-7 Quarry Tile - Quarry tile was directed for use in the kitchen in lieu of other materials previously specified.
- SD-11 Basketball and Handball courts - When nearing occupancy, CDC security personnel noted that the basketball and handball courts were not included in the design, but were necessary for inmate recreation.

CDC would have paid for the work in the original bids, had the changes or additions been known prior to award. However, the advantage of a competitively bid price was lost by having to add the work as a contract change. Pricing of change orders are based on estimates prepared by both the contractor and construction manager. The price development is based on mark-ups established by the contract provisions rather than the competitive marketplace.

It is our opinion that the premium to CDC for the contractor's mark-ups and other non-competitive costs is in the order of ten percent of excess change orders. From Exhibit IV-1, the change orders beyond the five percent contingency is \$2,466,183. Multiplying the excess change order amount by the ten percent premium, we estimate that approximately \$250,000 was paid in extra contractor fees. This additional cost could have been avoided if some design omissions and owner requests had been incorporated into initial bid packages.

C. The Project Team Effectively Mitigated the Impact of Contract Changes on the Schedule

Additional contract time often is given when added changes affect the completion of the contract. A total of 1,325 days were given as time extensions to the various contracts.

Whereas the individual contracts were extended, the overall project construction schedule goals for the revised prison project were essentially achieved. Phase I occupancy was originally scheduled for November 1986 and final occupancy in April 1987. Phase I facilities were handed over to CDC in mid-December 1986 and final occupancy was completed in September 1987. The delay in occupancy was not related to the status of construction, but some legislative restrictions placed on occupancy.

Although a large number of contract extensions were given, the project team was able to minimize the overall delay to the schedule.

D. Contract Changes Experienced at the San Diego Prison Were Less Than the Experience at Other New Prisons

Contract changes as a percent of contract award were compared between San Diego and four other new California prisons. Table 14, below, presents a comparison of the San Diego prison to the four other prisons we reviewed.

Table 14

Comparison of the San Diego Prison Contract Change Experience With Four Other California Prisons

Project	Contract Award Amount (a) (000)	Estimated Final Cost (000)	Change Order Total (000)	Percent
Amador	96,515	105,976 (b)	9,461	9.8
Avenal	124,539	135,418 (b)	10,879	8.7
Corcoran	163,238	179,307 (c)	16,069	9.8
Riverside	87,224	96,882 (b)	9,658	11.1
San Diego	<u>104,076</u>	<u>111,696</u>	<u>7,620</u>	<u>7.3</u>
Total all prisons	575,592	629,279	53,687	9.3

(a) Source: Construction Manager monthly progress reports.

(b) Source: CDC Capital Outlay Report, December 1988.

(c) Source: CDC Capital Outlay Report, September 1988.

The San Diego prison contract change experience is less than all of the other new California prisons we reviewed.

E. The Cost of Contract Changes Approximates the Allowed Contingency When Adjusted for Costs Which Cannot be Considered Normal Contingency Items

Several major changes were added to existing contracts to maintain the schedule, to change design criteria, or to add work to the project. These changes could be considered beyond the intent of the contingency for unforeseen situations.

Several changes which were identified during the interviews which were added to contracts by conscious decision are summarized in **Exhibit IV-3**, following this page. When these specific changes are deducted from the total changes, the change order percentage is reduced to 4.8 percent of total contracts awarded. It is likely that a more detailed review would identify other changes which could be considered outside the scope of normal contingency. Thus, the reduced change order percentage falls well within the range of normal contingency expectations.

F. There Were Only Two Construction Claims for the San Diego Prison

Out of the fifteen construction contracts at San Diego, there was only two construction claims. One was settled for \$25,952 in August, 1987. The remaining claim outstanding is for \$1.8 million and relates to the cogeneration plant at San Diego.^{2/} The claim is still pending and has not been scheduled for arbitration. The CDC believes the claim is unwarranted and will actively defend the claim. At the time of this writing, no potential settlement amount could be determined. If the claim is settled in the contractor's favor, the construction cost of San Diego would increase by an apportioned amount.

In general, the number of claims and its total dollar value compare favorably to other previous construction projects. There were only two prisons that were completed prior to San Diego and both experienced considerable number and amounts of claims. The first new prison constructed in the prison construction program was the Southern

^{2/} The CDC was unable to disclose particulars of this claim because of pending litigation.

**SPECIFIC CHANGE ORDERS
BEYOND THE SCOPE OF NORMAL CONTINGENCY**

DESCRIPTION	BID PACKAGE	CHANGE ORDER	AMOUNT
<u>Maintaining the Schedule:</u>			
Install Switchgear	SD-2	2	\$ 12,526
Electrical Changes	SD-6	7	997,234
Purchase 12 kv Switchgear	SD-6	15	422,681
<u>Meet the Established Design Criteria:</u>			
Glazing Changes and Additions	SD-6	17 & 26	273,069
Shower Tile	SD-6	2 & 35	132,036
Add A/C Units@ 12 Buildings	SD-6	10	170,206
Quary Tile	SD-7	3	182,937
<u>Added Scope:</u>			
Add Circulating Pumps	SD-5	68	247,710
Basketball and Handball Court	SD-11	51	253,295
<u>Temporary Facilities:</u>			
Install 6 Boilers & HHW Treatment Utilities to Temporary Buildings Facility 3	SD-5	32	53,937
	SD-5	57	86,114
Total Specific Change Orders			\$3,161,329
TOTAL SPECIFIC CHANGE ORDERS AS PERCENT OF ORIGINAL AWARD			2.62%
TOTAL CHANGES A PERCENT OF ORIGINAL AWARD			7.37%
TOTAL CHANGES AS PERCENT OF ORIGINAL AWARD EXCLUDING SPECIFIC CHANGE ORDERS			4.75%

Maximum Security Complex which had three claims filed and totaled \$21 million. The next prison completed was the CMF-South addition at Vacaville which had nine claims filed and totaled \$ 31.2 million.

The total dollar value of claims filed at San Diego is \$1.8 million. Based on this experience, it appears that claims filed against the CDC were significantly lower than the \$26 million average total filed at two earlier facilities. The total amount of claims and change orders, however, still exceeds the five percent contingency budgeted by the CDC. But, in summary, the claims experience at San Diego was minimal.

G. The CDC and the Construction Manager
Change Order Procedures are Generally In
Accordance With Industry Standards

Over the course of the prison construction program, the CDC and construction managers have developed change order procedures that are generally in accordance with industry standards. It was not until recently that the procedure has been standardized to all construction managers.

During the construction of San Diego, the change order procedures were fairly well developed. The procedures that were used during San Diego's construction were generally in line with industry norms. In October 1986, a CDC audit determined that change order files at Heery/Vanir CM, the construction manager at San Diego, were in compliance with their construction management contract.

Even though change order procedures were generally acceptable, we did identify some areas where the procedures were deficient. These are presented in the subsections which follow.

1. Change Order Reports Did Not Reconcile

During our review of change order procedures, we identified three sources of change order reports:

- CDC's Planning and Construction change order system
- CDC Contract Division's contract system
- Heery/Vanir progress reports.

Change order information contained in the three reports varied by source. The reports provided by Planning and Construction and Contracts only contained approval dates and amounts. The system maintained by Heery/Vanir was more detailed and also included a description of the change and a code describing the type of change.

In our review of change order reports provided by the three sources, change order amounts did not match. Many of the differences noted were due to deductive change orders having a positive amount.

2. Change Order Estimates Were Not in Accordance With the Terms of the Contract

To allow for change orders in construction contracts, the contracts contain General Conditions specifying the methods for determining amounts of change orders. The General Conditions describe allowable costs and mark-up percentages for the contractor and subcontractors.

During our review of change orders, we identified four areas where change orders were incorrectly estimated. The five types of errors are as follows:

a. Use of Wrong Mark-up Percentages

The General Conditions state that the mark-up for labor shall be 21 percent and for materials, equipment, and construction equipment, 16 percent. For portions of work performed by subcontractors, an additional mark-up of five percent is allowed for the Contractor. In our review of sample change orders, there were eleven instances where the contractor or the contract manager applied wrong mark-up percentages.

b. Addition of Unallowable Bonding Costs

The General Conditions include as part of the mark-up percentages, an allowance for bonding costs. Because bonding costs are already included in the mark-up percentages, no costs should be allowed for the cost of additional bonding. In our review of sample change orders, there were seven instances where the contractor added bonding costs in its change order estimates.

c. Inclusion of Unallowable Cartage and Handling Costs

Costs to cart and handle materials should be included in labor amounts. Because the cost should have been included in the labor estimate, there is a possibility of double-counting. Only one contractor had claimed this item as a separate cost.

d. Inclusion of Unallowable Small Tools Expense

The General Conditions of the contract state that "individual pieces of equipment having replacement value of \$100 or less shall be considered to be tools or small equipment, and no allowance will be made for such items." In spite of this clause in the contract, three contractors included an allowance for small tools in their change order estimates.

e. Mark-up on Sales Tax was Applied Inconsistently

The General Conditions do not address adequately sales tax mark-up. On earlier change orders, Heery/Vanir adopted a policy of not allowing the mark-up. Over the course of time, Heery/Vanir's policy was not followed and contractors continued to mark-up sales tax.

From the sample selected, the projected error from the five types of exceptions is approximately \$100,000. This error represents approximately one percent of all change orders. In our review of change order procedures, we also noted that cost estimates were not being audited for compliance with the General Conditions of the contract.

3. Time And Materials Change Orders Were Not Monitored Adequately

In our review of a sample of change orders, we identified two change orders that were for time and materials. For these change orders, the contractor is required by the General Conditions to submit to Heery/Vanir certified detailed daily records of all labor, materials, and equipment. Certification ensures that the labor and materials provided relates to a particular change order. The contractor also is instructed to maintain these records in its notice to proceed.

Of the two time and materials change orders we identified, neither had the required daily records. It appears that there was a breakdown in coordination between the Construction Manager and construction inspector regarding certification of time and materials change orders. It was not apparent at San Diego who had responsibility for certifying labor and material records. On current projects, the CDC now requires the Office of the State Architect Construction Inspector to certify all time and materials change order records. Finally, there were no progress billings to provide an adequate monitoring of a time and materials change order.

H. Conclusions

The new prison project at San Diego did incur additional costs due to change orders to the construction contracts. Some change orders reflect increases in work as the result of design changes and owner request and are not considered avoidable. However, approximately \$250,000 in extra fees could have been avoided. The increased cost reflects additional profits to contractors as a result of having to pay them set mark-up percentages as opposed to potential benefits from a competitively bid proposal. This additional cost, however, was a tradeoff for maintaining the schedule.

Many of the changes were required to assure that Phase I occupancy would be ready in November 1986, approximately 12 months after the start of construction. Although Phase I was available in December 1986, the CDC was restrained from occupying the facility until several months later. Some of the change order costs could have been avoided had the additional time for occupancy been known during the design and construction phases. Hope Consulting Group, the project Architect/Engineering firm, also noted that while there were some times were provided for drawing reviews, they were inadequate to incorporate review comments. They also noted that coordination was insufficient due to the tight time schedule.

Although the changes involved a total of 1,325 days extension to all the contracts, the overall schedule goals were essentially met. The project team including the CDC, Program Manager, design consultants, Construction Manager and contractors were able to maintain performance on the activities critical to the schedule.

The volume of changes at the San Diego prison was similar to that experienced on other phased design and construction prisons in the new prison program. When adjusted for change orders outside normal contingency, the changes are within the original contingency of five percent normally allowed by CDC for contracts in a phased program.

There was disagreement among the CDC and the Project Manager concerning the classification of change orders by the Construction Manager. There were some instances noted where the CDC changed the classification. This issue, along with the sheer number of change orders, may have contributed to an adversarial relationship between the Construction Manager and the design team which developed over the duration of the project.

The Program Manager currently is performing an analysis of change orders using different classifications which avoid differentiation between design error and omission. The Program Manager will classify these categories of change order as coordination. This differs slightly from the Contract Manager's classification because the Program Manager is aware of problems involved during the planning and design phases of the project. The Contract Manager on the other hand was not involved and can only classify the change order as either a design error or design omission.

Of the fifteen construction costs at San Diego, there were only two construction claims. One was settled for \$25,952 in August, 1987. The remaining claim outstanding is for \$1.8 million and relates to the cogeneration plant at San Diego. The claim is still pending and has not been scheduled for arbitration.

In general, the number of claims at San Diego compares favorably when compared to other previous construction projects. The first prison constructed in the prison construction program was the Southern Maximum Security Complex which had three claims filed that totaled \$21 million. The next prison completed was the CMF-South facility at Vacaville which had nine claims filed that totaled \$31.3 million. The total claims filed at San Diego of only \$1.8 million is significantly lower than the average \$26 million filed at the two earlier prisons.

From our review of change order procedures, the CDC and contract manager change order procedures are generally in accordance with construction industry standards. There were, however, several areas that we believed could be improved upon. In our review, we found several exceptions that deviated from the General Conditions. We estimated that the exceptions increased the cost of change orders by approximately \$100,000.

I. Recommendations

1. The CDC and its Program Manager should continue their efforts of improving the overall quality of original bid documents to minimize errors and omissions by the designers. Firmly established criteria and realistic design and construction schedules, including sufficient time for the design team to incorporate comments from design reviews, will assist in achieving this objective.
2. The classification of reasons for each change order should be determined initially by the Program Manager for approval by the CDC. The Construction Manager is not necessarily in the best position to judge the responsibility for the change because of not being involved in all phases of the project. Many changes are a result of interfaces between contracts, cost/schedule tradeoffs, or other bid packaging strategies which the CDC or Program Manager feel appropriate to meet the goals of the project. The Contract Manager is placed into an adversary role with other team members when acting as a judge of the designer and Program Manager.
3. Costs for temporary facilities associated with early occupancy criteria should be incorporated into budgeting and cost forecasting. Whenever possible, the temporary facilities should be incorporated into the original bid documents and be considered separately when evaluating change order experience.
4. During our review of change order files, we noted that there were several exceptions in the calculation of change order estimates from both the Construction Manager and the contractor. The CDC should audit construction manager and contractor estimates to ensure that change order estimates are properly calculated.
5. At San Diego, there were two time and material change orders. For both change orders, required daily records for labor, materials, and equipment were not properly maintained. There was a lack of coordination between the Construction Manager and the Office of the State Architect in regards to the certification of the required documentation. We understand that on current projects, the Office of the State Architect is now responsible for certifying required time and material documentation. The CDC should continue this practice to ensure labor and materials provided relate to a time and materials change order. Also, the CDC should require that the contractor submit progress billings on the change order at least monthly.

V.

THE CDC HAS EXPERIENCED PROBLEMS IN
THE OPERATION OF THE SAN DIEGO PRISON

Construction and design of the San Diego prison was phased to allow occupancy as early as November 1986. The first housing unit of the prison was completed in December 1986 but was not occupied by inmates until September 1987. The legislation that provided the funding of the San Diego prison (SB 422) did not allow occupancy of the prison until two other prison sites were selected in Los Angeles. Inmates now have been housed at the new prison for over a year and the CDC is still experiencing some problems in the operation of the new prison.

A. Four Gymnasiums Still Contain Security
Problems and Are Not Being Used

Each of the four medium security facilities at San Diego has its own gymnasium, but none of the gymnasiums are being used. One reason is that there are some security problems with the design of the gymnasium. Problems identified by the CDC include:

- The open area above rooms located on the side wall of the building
- The insulating material used on the exterior walls
- The open area located underneath bleacher seats.

Two of the three security problems noted above have been remedied. The open area above rooms on the side wall of the gymnasium has been fenced, and allowance made for armed coverage. The insulating material used on exterior walls has been covered with plywood up to a height of 10 feet. The item still remaining is fencing of the bleacher seats to prevent access by inmates. The CDC is currently installing the required fencing. One facility has the modification completed and the CDC anticipates completion of the project by April 1989. For its newer facilities, the CDC has modified the design of the gymnasiums to reduce the security problems encountered at San Diego.

B. The Textile Mill Building Is Unoccupied

During the planning and design phase of the San Diego prison, the Prison Industries Authority (PIA) was unsure on how to proceed with the design of the tenant improvement for the proposed textile mill. Rather than hold up the entire project, the CDC agreed to furnish the PIA with a building shell with the stipulation that the PIA would provide all tenant improvements.

Not having implemented a textile industry program in any of the other prisons, PIA's inexperience hampered the already complicated planning and design of the textile mill. Upon completion of the design, the PIA determined that the mill would cost significantly more to construct than the original estimate of \$3 million.

In 1988, the PIA estimated the cost of the improvements to be approximately \$5 million. Construction of the textile mill was again delayed as the PIA evaluated ways to reduce costs. The PIA made the decision to use inmate labor in order to bring the construction cost of the mill within the original proposed budget. The PIA recently began construction of tenant improvements and anticipates completion of the textile mill by June 30, 1990.

None of the delays in completing the textile mill had any affect on the CDC's cost or scheduled completion date of the San Diego prison. The CDC was not responsible for the textile building not being used. Once the CDC provided the building shell to the PIA, it had no further involvement with the tenant finishes or improvements. The textile mill remains the responsibility of the PIA.

C. Certain Areas of the Medium-Security Facility Contain Non-Secure Materials

The CDC, in an effort to reduce construction costs, used some less secure materials in the construction of certain areas of the medium security facility. The kitchen and the dining areas contain gypsum board on some interior walls. To repair holes caused in the walls by inmates, and to reduce future damage, the CDC installed plywood and fiberglass wainscot paneling over part of the gypsum walls. During our on-site visit, we noted that this was not sufficient to reduce damage above the paneling as holes were still evident.

The use of gypsum and other non-secure materials has resulted in increased maintenance costs and security risks. In 1988, the CDC spent approximately \$15,000 for materials to cover the lower portion of the kitchen and dining area walls.

Since the construction of the San Diego prison, the CDC has increased the use of concrete in kitchen and dining areas. In the more recent plans, the use of gypsum has been eliminated. The CDC Design Criteria Manual, however, has not yet been modified to limit the use of gypsum board in medium and higher security kitchens and dining areas.

D. Some Problems Still Exist at the Cogeneration Plant

The cogeneration plant was completed in July 1988. As stated in the contract, the completion date was to be April 1987. Reasons for the delay included bad welds, unsupported pipes, and emission problems.

The same contractor constructing the San Diego plant also was awarded the contract to build two cogeneration plants at the Avenal prison. The two Avenal plants are still not operative. The contractor recently filed a \$1.8 million claim against the CDC. Because the completion of the San Diego cogeneration plant was delayed, the CDC had to purchase more expensive electricity from San Diego Gas & Electric.

The CDC has not experienced any major problems with the generator. However, the prison operational staff have become concerned with the switchgear which was provided by another vendor. The manufacturer of the switchgear is no longer in business and this may pose a problem in getting future replacement parts.

During our on-site tour of the plant we also noticed a potential security problem with the cogeneration plant. The cogeneration plant is not fenced. The plant is a very expensive and delicate piece of equipment which is vital to operations as it supplies all of the electricity to the facility. Inmates wandering into the plant could cause havoc to the whole prison.

E. Conclusions

The CDC has experienced some problems in the operation of the San Diego prison. The gymnasiums were completed in 1987 and still remain unoccupied. The textile mill building built for the Prison Industry Authority remains empty and unused. The prison's dining and kitchen areas were designed with gypsum interior walls which are easily damaged by inmates. Also from our on-site tour of the San Diego prison, we noted that the cogeneration plant was not secured. The plant provides all the electrical services for the prison and inmates in the area could damage the source of power for the whole facility.

F. Recommendations

1. The design and construction of newer prison facilities has incorporated improvements to prior designs and carried forward designs that the CDC and the Project Manager considered well designed. The CDC should continue this evolutionary process.
2. The CDC used some less than secure materials in the construction of the Dining and Kitchen areas of the San Diego prison. In the construction of subsequent prisons, the CDC has modified the designs of Dining and Kitchen areas to minimize the use of gypsum board. The CDC has not updated its Design Criteria manual to reflect the change in materials. The CDC should update the Design Criteria Manual to prohibit the use of gypsum board in interior walls of the kitchen and dining areas in medium and higher security facilities.
3. The CDC should secure the cogeneration plant with appropriate security measures to prevent inmates from entering the plant and damaging the equipment. The cogeneration plant at the San Diego prison is not adequately secured to prevent inmates from entering the facility and damaging the source of electrical supply to the whole prison.

YOUTH AND ADULT CORRECTIONAL AGENCY
OFFICE OF THE SECRETARY



April 4, 1989

Kurt R. Sjoberg
Acting Auditor General
660 J Street, Suite 300
Sacramento, California 95814

P-847.2

Dear Mr. Sjoberg:

Thank you for the opportunity to comment on your draft report entitled "An Audit of the California Department of Corrections' Construction of the San Diego Prison."

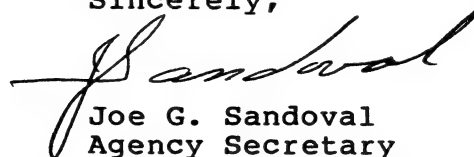
As with your prior report, "An Audit of the California Department of Corrections' Program Management Contractor," we viewed this report as an opportunity to review the effectiveness of the procedures used by the Department in managing this \$3.2 billion program within the context of the program's aggressive goals and objectives. I am very pleased that this audit has again reaffirmed the strength of our project management, fiscal and contract systems and the accuracy and completeness of our fiscal records. I also appreciate the fact that the auditors have recognized the difficulties and challenges that the Department faced in reducing the San Diego project from the initial estimate of \$194 million to the current \$158 million budget, while attempting to minimize delays and meet correctional design standards and the legislatively established cost per bed target.

I believe that this audit strengthens the findings of the prior report and again confirms that the Department's public-private sector partnership approach has been very effective.

Regarding the specific findings presented in your report, we would like to offer the attached comments and information.

Again, thank you for the opportunity to comment. If you would like to discuss our comments, please contact Craig Brown, Undersecretary, Youth and Adult Correctional Agency, at 3-6001.

Sincerely,



Joe G. Sandoval
Agency Secretary

Attachment

AN AUDIT OF THE
DEPARTMENT OF CORRECTIONS
CONSTRUCTION OF THE SAN DIEGO PRISON
CDC RESPONSE

1. Audit Recommendation:

The contract with Heery/Vanir (construction manager for the San Diego prison) is not clear as to how indirect labor charges are to be allocated among the different prisons. Heery/Vanir presently bills charges based on the proportion of direct labor charges for the various projects. In the future, contracts with construction management contractors should specify the methodology for charging each prison for labor hours of personnel who work on various prisons.

CDC Response:

CDC concurs and will ensure that future Construction Manager contracts which involve more than one prison project specify the appropriate methodology.

2. Audit Recommendation:

In determining what the actual budget was for the San Diego Prison, we encountered difficulties in obtaining an original budget. In order to monitor and assess the status of projects, we recommend that the CDC designate one original budget and not modify this budget during the prison project.

CDC Response:

CDC agrees. This is the process that has been followed for all recent projects and is being followed for all projects currently in design or construction. The San Diego budget tracking was complicated by prior budgeting and reporting requirements. These problems were substantially improved by changes in the manner in which the Legislature approves and funds these projects as well as the manner in which the State Public Works Board approves and monitors these projects.

3. Audit Recommendation:

The CDC and Kitchell are currently monitoring the cost per bed of prisons in the new prison construction program. It is recommended that the CDC, assisted by its Program Manager, continue to closely monitor, manage and compare the cost per bed of all facilities throughout the program by security level classification.

CDC Response:

CDC agrees and will continue to monitor, manage and compare the cost per bed of all facilities by security level classification.

4. Audit Recommendation:

The CDC should continue the current practice of preparing detailed cost models and schedules which were not yet formalized for the San Diego Prison. Separate contingencies recognizing the preliminary nature of early estimates should be incorporated in the development of budgets prior to approval.

CDC Response:

CDC agrees and will continue the current practices of preparing detailed cost models and schedules. CDC also agrees that certain levels of estimating contingencies should be included in project budgets when the projects are still in the process of design.

5. Audit Recommendation:

Cost Control and Schedule Reports should be issued by the Program Manager on a monthly basis throughout the design and construction phases, as recommended in the Office of the Auditor General's February 1989 report, "An Audit of the California Department of Corrections' Program Management Contractor."

CDC Response:

CDC has previously considered the benefit of consolidating existing schedule and budget reports. However, as we are concerned about controlling all costs of a project, including consultant fees, we had previously determined that the relative benefits may not justify the additional expense. We recognize that there are certainly some benefits that would result from this recommendation and will reconsider our prior decision to maintain separate reports.

6. Audit Recommendation:

The CDC should review all future projects and establish a common work breakdown structure so that original budgets, actual costs, and forecast costs at completion prepared by the Program Manager, the CDC and the Construction Manager are prepared in an integrated manner, consistent with one another. The CDC should assign the responsibility for implementing this recommendation to its Program Manager.

CDC Response:

CDC concurs with the majority of this recommendation. There is a common work breakdown structure that has been adopted for the projects and utilized by the Program Manager and the Construction Managers. It should be recognized however, that since the Cost Control Reports and field change

order reports include preliminary estimates which may be subsequently adjusted, they frequently will include amounts not included in the formal approved budget reports maintained by CDC. CDC agrees these reports should be integrated where appropriate and reconcilable.

7. Audit Recommendation:

The CDC and its Program Manager should continue their efforts of improving the overall quality of original bid documents to minimize errors and omissions by the designers. Firmly established criteria and realistic design and construction schedules, including sufficient time for the design team to incorporate comments from design reviews, will assist in achieving this objective.

CDC Response:

CDC agrees and will continue these efforts. CDC is very pleased with the continued improvements in these areas as previously recognized by the auditors.

8. Audit Recommendation:

The reasons for change orders should be determined initially by the Program Manager for approval by the CDC. The Construction Manager is not necessarily in the best position to judge the responsibility for the change because of not being involved in all phases of the project. Many changes are a result of interfaces between contracts, cost/schedule tradeoffs, or other bid packaging strategies which the CDC or Program Manager feel appropriate to meet the goals of the project. The CM is placed into an adversary role with other team members when acting as a judge of the designer and Program Manager.

CDC Response:

We believe the Construction Manager should do the initial evaluation of the responsibility for the change order. As this is only advisory to the Department, we feel this role can be accomplished in a non-adversarial manner. However, we will instruct the Program Manager to be more actively involved in this area to ensure that the initial analysis is accurate.

9. Audit Recommendation:

Costs for temporary facilities associated with early occupancy criteria should be incorporated into budgeting and cost forecasting. Whenever possible, the temporary facilities should be incorporated into the original bid documents and be considered separately when evaluating change order experience.

CDC Response:

CDC agrees and is doing so on all new projects where the schedules indicate a need for such costs.

10. Audit Recommendation:

During our review of change order files, we noted that there were several differences in the cost estimates for change orders made by the Construction Manager and by the contractor. The CDC should audit construction manager and contractor estimates to ensure that change order estimates are properly calculated.

CDC Response:

Although the number of problems were very limited, CDC has instituted additional reviews to ensure accuracy of the calculations of change order estimates.

11. Audit Recommendation:

At San Diego, there were two time and material change orders. For both change orders, the required daily records for labor, materials, and equipment were not properly maintained. There was a lack of coordination between the Construction Manager and the Office of the State Architect in regards to the certification of the required documentation. We understand that on current projects, the Office of the State Architect is now responsible for certifying required time and material documentation. The CDC should continue this practice to ensure labor and materials provided relate to a time and materials change order. Also, the CDC should require that the contractor submit progress billings on the change order at least monthly.

CDC Response:

As acknowledged by the auditors, steps have been taken to clearly place responsibility for certifying time and materials documentation with the Office of the State Architect site inspectors. CDC is currently reviewing the recommendation that contractors submit billings on such change orders at least monthly.

12. Audit Recommendation:

The design and construction of newer prison facilities has incorporated improvements to prior designs and carried forward designs that the CDC and the Project Manager considered well designed. The CDC should continue this evolutionary process.

CDC Response:

CDC will continue to incorporate design improvements to prior designs as they are carried forward to new projects. We certainly believe and the auditors have recognized that many of the problems identified in the earlier facilities have been resolved in the later facilities.

13. Audit Recommendation:

The CDC used some less than secure materials in the construction of the dining and kitchen areas of the San Diego prison. In the construction of subsequent prisons, the CDC has modified the designs of dining and kitchen areas to minimize the use of gypsum board. The CDC has not updated its Design Criteria Manual to reflect the change in materials. The CDC should update the Design and Criteria Manual to prohibit the use of gypsum board in interior walls of the kitchen and dining areas in medium and higher security facilities.

CDC Response:

As indicated by the auditors, CDC has modified the designs of dining and kitchen areas to minimize the use of gypsum board. These modifications have been incorporated into the design prototypes. We are also in the process of making these changes to the Design Criteria Manual.

14. Audit Recommendation:

The CDC should secure the cogeneration plant with appropriate security measures to prevent inmates from entering the plant and damaging the equipment. The cogeneration plant at the San Diego prison is not adequately secured to prevent inmates from entering the facility and damaging the source of electrical supply to the whole prison.

CDC Response:

CDC is evaluating this recommendation to determine what additional security measures may be necessary. It should be noted that the cogeneration system is not the primary electrical power source for the institution and that there are also backup power sources for critical areas. Nevertheless, we agree this issue should be reviewed further.

cc: Members of the Legislature
Office of the Governor
Office of the Lieutenant Governor
State Controller
Legislative Analyst
Assembly Office of Research
Senate Office of Research
Assembly Majority/Minority Consultants
Senate Majority/Minority Consultants
Capitol Press Corps